Farm Chemicals

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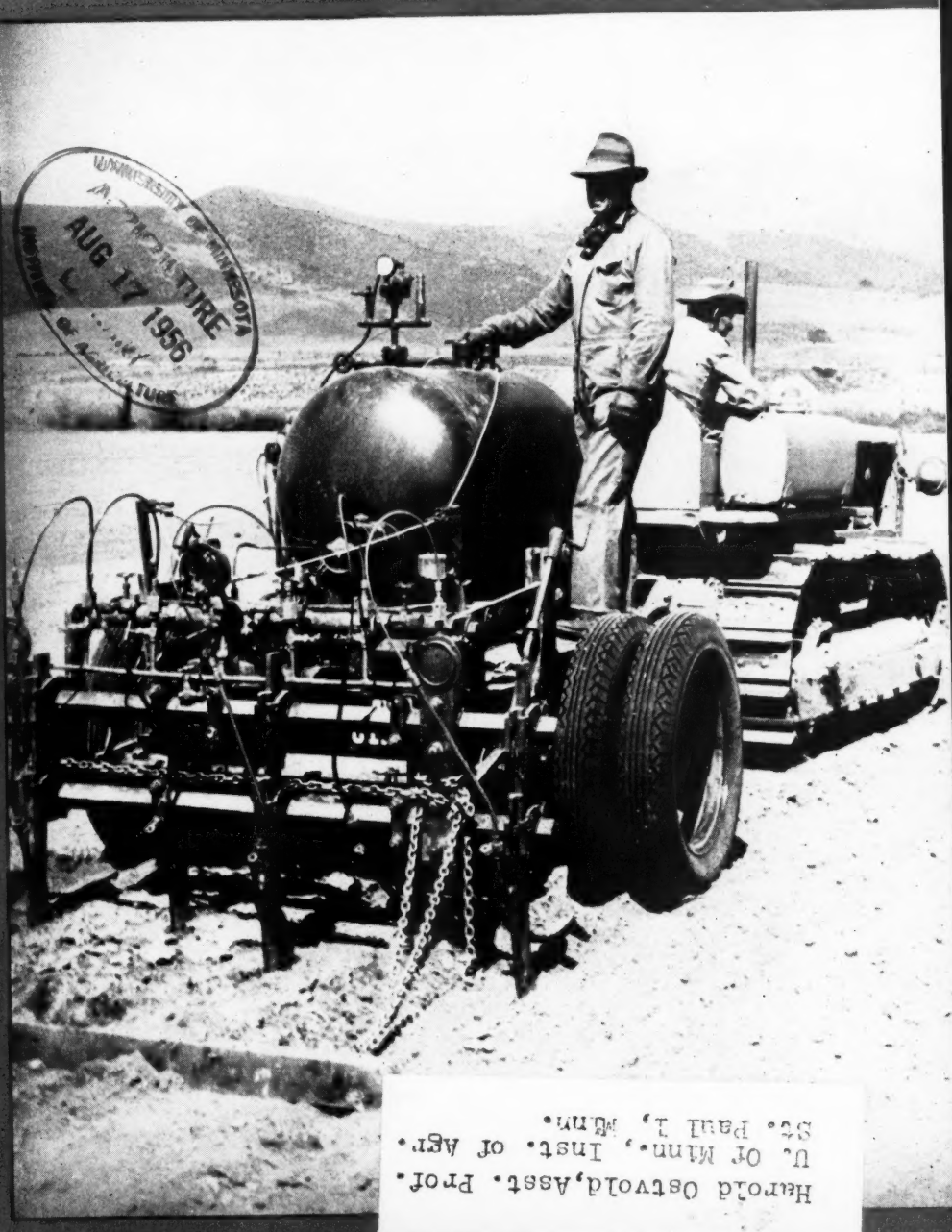
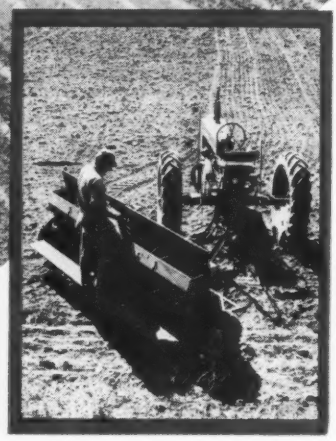


UNIVERSITY OF MINNESOTA
AGRICULTURE
AUG 17 1956

Harold Ostvold, Asst. Prof.
U. of Minn., Inst. of Agr.
St. Paul 1, Minn.

Vol. 119 No. 8 AUGUST 1956 50 Cents



TRIPLE SUPERPHOSPHATE

1. RUN-OF-PILE FOR MAXIMUM AMMONIATION
2. GRANULAR FOR DIRECT APPLICATION
3. PROMPT SERVICE TO MEET EVERY REQUIREMENT

The source of superior phosphate fertilizers for nearly 30 years, U. S. Phosphoric Products is your ideal source for quality and dependability in Triple Superphosphate. Your Bradley & Baker sales representative will be glad to help you plan your shipments for maximum satisfaction. *Call upon him today.*

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LINK-BELT "turn-key" SERVICE

unlocks new efficiencies in fertilizer production

Up goes steel work and Link-Belt equipment for another fertilizer plant handled on a "turn-key" contract. This TVA continuous ammoniator process will utilize anhydrous ammonia and ammonium nitrate solutions.

Under this inclusive 5-point program, LINK-BELT will:

1. **PILOT THE PROCESS,** using our complete laboratory and test facilities.
2. **DESIGN THE SYSTEM** as an efficient, integrated operation conforming to your exact needs.
3. **FABRICATE THE EQUIPMENT.** Link-Belt makes a complete line—will also supply special requirements.
4. **ERECT THE PLANT,** providing crews and supervisory service.
5. **START THE OPERATION,** with field engineers ready to make final adjustments.

FREEDOM from construction detail . . . integrated operation . . . a uniform product—Link-Belt "turn-key" service offers these and more benefits for fertilizer plants. Our specialists stand ready to cooperate with your engineers or consultants to produce a top-grade fertilizer at minimum cost.

Link-Belt experience includes dry-mix, superphosphate, ammonium phosphate, ammonium nitrate, ammonium sulphate, urea, granular and other types of fertilizer. If you're planning a new operation or feel your present system should be modernized, you'll want full details. Write for Book 2459 showing equipment and typical layouts . . . or call your nearest Link-Belt office.

LINK-BELT

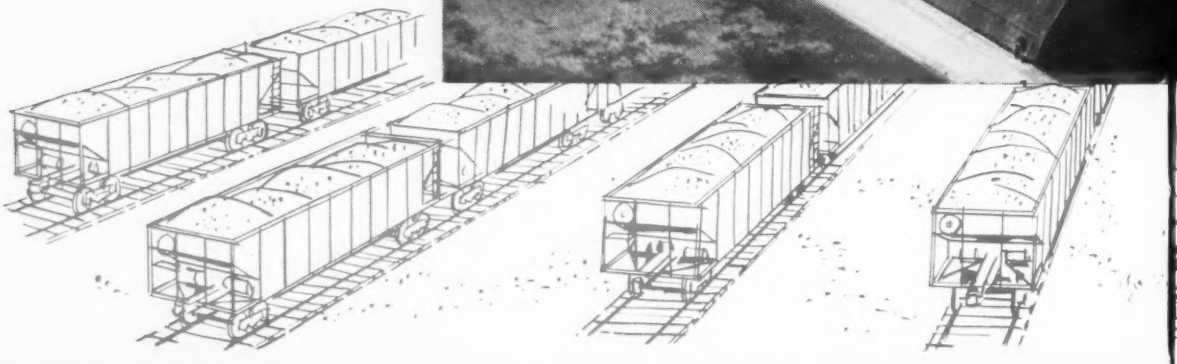
PLANTS AND EQUIPMENT FOR THE FERTILIZER INDUSTRY

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14.148

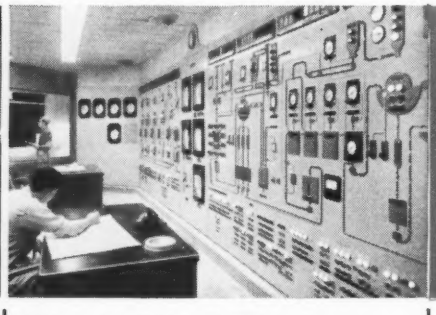
There's a good reason why . . .

Last year's customers a

This 85,000-ton curing unit — as big as two full-sized football fields — is one example of the time and big capacity needed to produce natural-cured triple.



Round-the-clock production takes the push out of peak season demands. Mammoth off-season storage capacity plus the industry's finest delivery schedules assure you high-quality triple when you need it.

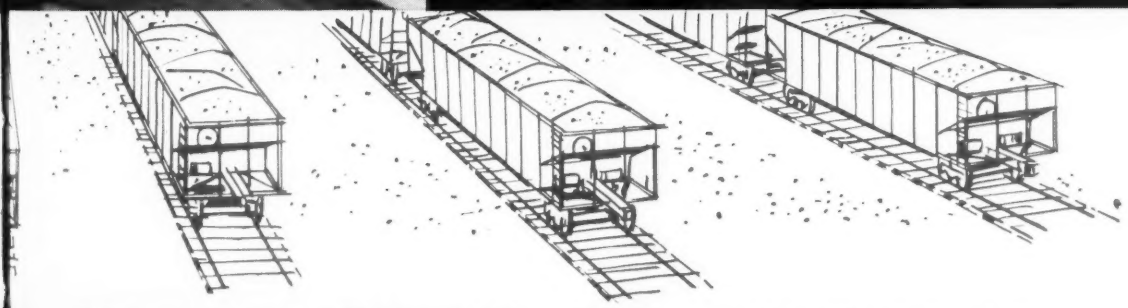


These "doodads" and dials get results . . . guard the uniformity and quality of every batch of triple super from Bonnie . . . help assure you of top ammoniation results every time.

MINERALS International CHEMICALS

s are this year's contracts

They tried . . .
were satisfied
. . . and signed



In just one year, over ¼ million tons of triple super sales have switched to Bonnie. That's how we know there's a new sense of satisfaction among triple super users this year.

In typical cases, manufacturers ordered spot shipments . . . tried our triple . . . and were satisfied. And before long, the word got around — "International's new triple is *really* good." In fact, even nitrogen producers began recommending our triple to their customers with ammoniation problems. The reasons?

Reliability — one high-quality source. *Quality* — unbeatable control with product uniformity that makes formulation easier. *Fast service* — mammoth inventory at conveniently-located warehouses. *Priced right* — to help you meet competition. *Friendly cooperation* — from International's transportation department. *Technical assistance* — that helps cut formulation costs.

If you have not already signed, we invite you to consider International.

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

Phosphate Chemicals Division • General Offices: 20 North Wacker Drive, Chicago 6

Farm Chemicals

AUGUST, 1956
No. 8
Vol. 119

Pioneer Journal of Farm Chemicals Industry, Est. 1894

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BPA
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A magazine national in scope and circulation and devoted to manufacturers, mixers and formulators of plant foods and pesticides. It has a free controlled circulation within specified segments of the industry.

Subscription rates to all others are: U.S., its possessions, Canada, Cuba and Panama—$6.00; Mexico and foreign: $7.50. Single Copy—$.50. Back Numbers $1.00.

Published monthly by Ware Bros. Company, 317 N. Broad St., Philadelphia 7, Pa.
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In this issue . . .

The second and concluding part of the US Dept. of Commerce survey of foreign pesticide opportunities, as reported by John Harms, begins on page 37. This month Harms covers the situation in Europe, Africa, Asia and Oceania and tells you where more specific information can be obtained.

For a review of progress in nematode control see page 41 and a review of information presented by V-C's Dr. M. A. Manzelli at the recent meeting of Southern control officials. The meeting itself is covered on pages 50-51.

Wisconsin FARMCO Coop's new Prairie du Chien plant incorporates a novel split stream granulation unit claimed to provide maximum production in limited quarters. Pages 44-45 include a description and pictures of the installation.

An Arizona farm economist discusses the farm problem, beginning on page 47, with a viewpoint that will make interesting reading to anyone concerned with the agricultural plant.

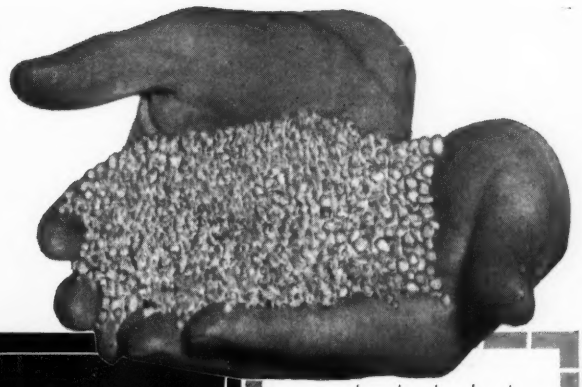
Also in this issue are notes on some of the important papers delivered at the recent Pacific Regional Fertilizer Conference (page 46) and a brief description (page 52) of experiments in which silicone compounds have been tested successfully as lubricants for fungicidal seed protectants.

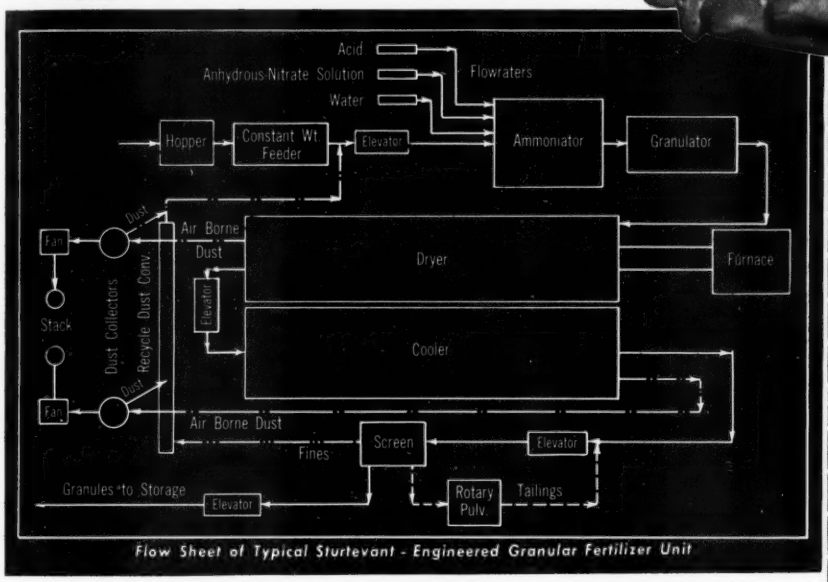
Cover story

Rapid advances in nematode control methods have brought to growers several new and effective chemicals designed to combat the insidious soil pests. A popular means of applying some of the control materials is with injection rigs such as the Cat-drawn unit pictured on the cover.

Photo courtesy Shell Chem. Corp.

Granular Fertilizer Can Be in Your Future, too!





Flow Sheet of Typical Sturtevant - Engineered Granular Fertilizer Unit

LET STURTEVANT ENGINEERING AND EQUIPMENT MAKE THIS YOUR GRANULAR FERTILIZER UNIT

If you operate a mixing plant, there's a granulator in your future. The signs are unmistakable. Granular fertilizer is replacing its powdered cousin faster than modern processors can keep up with the demand.

Take the case of Canada Packers, Limited, of St. John, New Brunswick. Fourteen months after Sturtevant engineers assisted in adapting this customer's plant to a granular product, the balance of orders had shifted to 70% granular against 30% powder — *and management expects in a very short time (perhaps as you read this) that shipments will be 100% granular.*

Of course, we at Sturtevant Mill Co. are not market authorities, although we do believe this experience by Canada Packers, Limited is significant.

Our business is to assist you with the designing and engineering of the best possible granular fertilizer unit for your needs — also super phosphate units and conventional mixing units, according to your requirements.

Serving the fertilizer industry has been our business since 1873 . . . which is why you won't get rash promises or rush engineering when you come to Sturtevant. You will get a unit that will produce *what* it's supposed to *when* it's supposed to.

Why not let Sturtevant help you to spell out *your* future in granular fertilizers by writing today? Use the convenient coupon on the right.

STURTEVANT

Dry Processing Equipment

The "OPEN DOOR" to *lower* operating costs over *more* years

PULVERIZERS • CRUSHERS • MICRON-GRINDERS • GRANULATORS • SEPARATORS
SCREENS • MIXERS • FEEDERS • ELEVATORS • CONVEYORS
MECHANICAL DEN & EXCAVATORS

STURTEVANT MILL COMPANY, 140 Clayton Street, Boston 22, Mass.

Please send me your bulletin on Granulators ☐
Also bulletins on Sturtevant machines for:

☐ CRUSHING ☐ GRINDING ☐ PULVERIZING
☐ MICRON-GRINDING ☐ SEPARATING ☐ MIXING
☐ SCREENING ☐ FEEDING
☐ MECHANICAL DEN & EXCAVATORS ☐ ELEVATING & CONVEYING

I am interested in a new unit ☐ conversion ☐

Desired capacity is_____

Name_____ Title_____

Firm_____

Street_____

City_____ Zone_____ State_____

SALESMEN... to help boost YOUR profits!

LION Advertisements Sell LION Nitrogen, *and* Your Mixed Goods, Too!

Continuous Lion advertising appears in leading farm publications, month-after-month, to pre-sell the Lion brand to farmers—and to sell the value of *your mixed fertilizers as well!*

Current advertisements are appearing in Farm and Ranch-Southern Agriculturist, Progressive Farmer, The Farmer, Nebraska Farmer, Kansas Farmer, Prairie Farmer, Wallace's Farmer & Iowa Homestead, Wisconsin Agriculturist and Farmer, Missouri Ruralist and Missouri Farmer. All of these advertisements are in color.

Each Lion advertisement promotes the economic benefits of properly using fertilizers, including Lion Ammonium Nitrate, to help increase the farmer's profits. Each advertisement sells *hard* on the importance of soil tests in the intelligent use of all commercial fertilizers. Lion, a leader in nitrogen production, leads the way to good fertilization practices . . . to better profits for you!

LION'S QUALITY LINE OF NITROGEN FERTILIZER MATERIALS

LION ANHYDROUS AMMONIA—82.2% nitrogen. Quality guaranteed.
LION AQUA AMMONIA—Ammonia content above 30%—other grades to suit your requirements.
LION AMMONIUM NITRATE FERTILIZER—Improved spherical pellets. Guaranteed 33.5% nitrogen.
LION NITROGEN FERTILIZER SOLUTIONS—Various types to suit your particular manufacturing needs.
LION SULPHATE OF AMMONIA—White, uniform, free-flowing crystals. Guaranteed 21% nitrogen.

LION OIL COMPANY

A DIVISION OF MONSANTO CHEMICAL COMPANY

EL DORADO, ARKANSAS

DISTRICT SALES OFFICES: Lion Oil Building, El Dorado, Ark. • Insurance Exchange Building, Des Moines, Ia. National Bank of Commerce Building, New Orleans, La. • 1401 Building, Atlanta, Ga.

Successful growers rely on dieldrin seed treatment

In the past, newly planted seeds were at the mercy of wireworms, rootworms, seed-corn maggots, false wireworms, and other soil pests. Today the picture has changed. Growers can protect seeds from soil pest damage with a dieldrin preventive seed treatment *before planting.*

Low-cost protection—A dieldrin preventive seed treatment costs just a few pennies per acre. It eliminates the expense of replanting "spotty" stands . . . assures growers of a longer grazing period.

Compatible with fungicides—Dieldrin formulations remain stable when mixed with commonly used fungicides. You can mix and apply both at the same time.

Long residual action—A single dieldrin seed treatment gives your customers effective soil pest protection until the seeds sprout.

Treat now—plant later. Dieldrin, unlike many other insecticides, can be applied to seeds long before planting. Your customers save valuable time during the busy planting season.

Safe to use—Dieldrin will not harm seed germination or root growth when used according to directions.

This season recommend and sell dieldrin seed treatments to your customers. You'll build bigger sales volume and create greater customer satisfaction. Complete technical information on dieldrin seed treatment is available. Write to:

SHELL CHEMICAL CORPORATION
AGRICULTURAL CHEMICAL SALES DIVISION
460 Park Avenue, New York 22, New York

SHELL

Business & Management

. . . News of the Industry

Chemico Sold to Elec. Bond & Share

Transfer of Chemical Construction Corp. from American Cyanamid to Electric Bond and Share Co. was recently announced by G. G. Walker, pres. of Ebasco.

Chemico will be run as an independent unit along with Ebasco Services, Inc., another construction firm owned by Electric Bond and Share. It is felt that each will benefit, since they will be able to draw on each other's talents, offering accounts more services.

Mitchell to Build Helena, Ark. Plant

Mitchell Insecticide Co. plans to establish a plant this summer at Helena, Ark. Bill Mitchell, president of the company, announced that the firm plans to take possession of a suitable building on Aug. 1.

This is the third plant for the concern, which has plants located at Fairfax, Ark. and in Georgia.

West. Phosphates Plans Expansion

Western Phosphates, Inc. plans a 2 million dollar expansion at its Garfield, Utah plant. Results of the expansion will add to the variety of liquid type nitrogen-phosphate fertilizer available by the end of the year.

Pennsalt to Build Mexico City Plant

Early construction of a third plant in Mexico is planned by Pennsalt Chemicals. To be known as Industrial Quimica, S. A. de C. V., it will operate in conjunction with Pennsalt International Corporation.

Products from the new installation, slated for a site near the firm's Mexico City farm chemicals plant, will include chlorine, caustic soda, muriatic acid and hydrogen. The plant is expected to become the first in Mexico to manufacture technical DDT.

Robt. P. Ogden, former manager of Pennsalt's Riverview, Mich. plant will direct its operations.

Cook Chem. Offer $25,000 Bug Reward

Ralph G. Martin, pres. of Cook Chemical Co., has announced a 25,000 dollar reward "for the first bug that does not die after being sprayed" with the company's "Real-Kill" household insecticide.

The contest is to run three months, and if there is no winner the reward will be given to a national charity.

Central Fertilizer Delays Construction

Delays in start-up of construction of the Central Fertilizer Co. phosphate plant at Georgetown, Ida. are reported. According to one spokesman, plans were not expected to be completed before July and at that time construction bids would be sought.

Initially the firm expected to see construction under way this spring and part of the facilities in operation by the beginning of 1957.

Miss. Plant Fire

A fire at the Magnolia Oil Mill plant in Magnolia, Miss., reportedly destroyed the facilities at a loss of $200,000. The factory was owned by George Covington.

DAP Prod. Planned by Shell Chemical

A 400 ton diammonium phosphate marketing run last fall convinced Shell Chemical Corp. that DAP's sales potential is finally ready to be tapped. To meet this market, 5,000 tons of the material will be produced in facilities previously built for ammonium sulfate production.

Shell's decision to produce the material is part of a product diversification program that already includes a 150 ton/day urea plant now nearing completion.

It fits in with three current trends in fertilizer use—high analysis products, pelletization, custom formulation. Since mixing DAP and ammonium sulfate gives a wide range of N-P ratios, formulators will be urged to base their blends on Shell's new one—two punch.

Stauffer Expands Chauncey Vapam Unit

Responding to increased demand for Vapam, Stauffer Chemical Co. has completed an expansion at its Chauncey, N. Y. plant providing quadrupled production capacity for sodium n-methyl dithiocarbamate, essential ingredient in the soil sterilant.

Vapam is shipped from Chauncey in bulk to eastern distributing plants operated by Stauffer's agricultural chemicals division.

The material is also produced at Richmond, Calif. where an expansion was completed last fall.

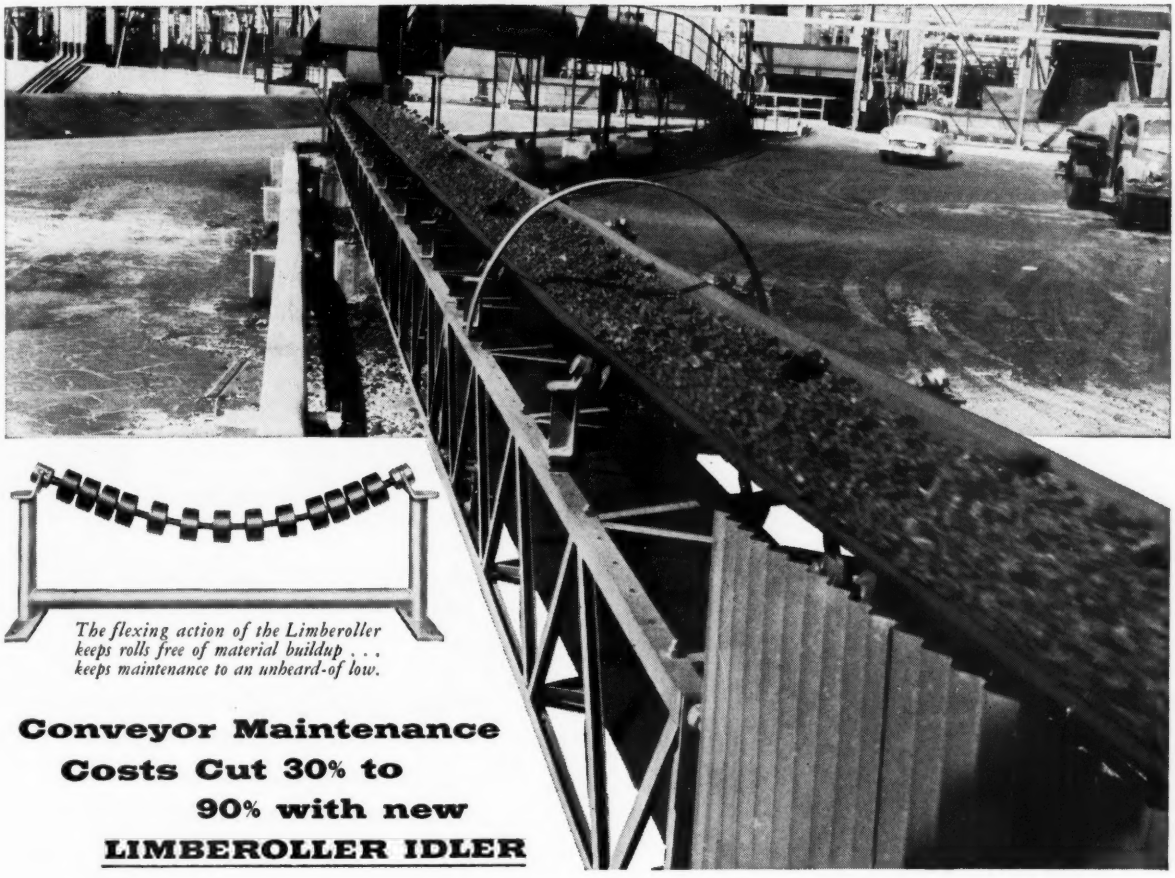
B-W Fertilizer Pills For Garden Hose

Fertilizer pills that fit into a garden hose are now being produced by the B-W Fert. Co. of Columbus, Neb. The firm, operated by Henry B. Bothe and Elmer Wurdeman, also makes liquid plant foods marketed in plastic bottles.

At Last...

the JOY LIMBEROLLER IDLER...

a new type of belt conveyor idler that will handle sticky fertilizers without material buildup on rolls



The flexing action of the Limberoller keeps rolls free of material buildup . . . keeps maintenance to an unheard-of low.

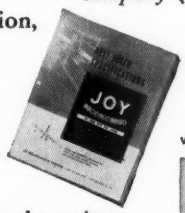
Conveyor Maintenance Costs Cut 30% to 90% with new LIMBEROLLER IDLER

The *Limberoller* is a new type of belt-conveyor idler that has been setting length-of-life records wherever used. It has already given over *twelve times* the service life of conventional idlers in many applications. It has proved extremely efficient in handling triple super-phosphate, ammonium sulphate and sticky fertilizers.

The Joy *Limberoller* resists dust, abrasion, corrosion and material buildup. Resilient molded discs on a flexible steel cable conform to load and cushion the belt. Only two bearings are used and these are up out of the dirt zone. Get details from *Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.* In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

LIMBEROLLER

THE IDLER WITH FLEX APPEAL



Write for FREE Bulletin 113-77

It gives complete information on the unique Limberoller Idler, and we'll be glad to supplement it with engineering assistance on your particular problem.

Consult a Joy Engineer

WSW 1 6201-113

JOY

SINCE 1851—OVER 100 YEARS OF ENGINEERING LEADERSHIP

We are telling millions of farmers

Fertilizer Grows Farm Profits

Farming today requires a bigger investment per worker than most major industries. It takes money to make money farming.

Fertilizer is one of the lowest cost items the farmer buys, closer to pre-war prices than anything else needed to grow crops. Fertilizer helps a farmer to get greater returns from his other investments in land, labor, machinery and other production costs.

The vital importance of fertilizer to the farmer is being brought to the attention of millions of readers of farm magazines in a powerful and continuing campaign conducted by Nitrogen Division, Allied Chemical & Dye Corporation.

Shown on the opposite page is one in a series of big, full-page advertisements appearing in farm magazines. Others have preceded it and more will follow. We trust that this campaign meets with your approval and we will greatly appreciate any comments or suggestions you may wish to send us.

"My farm has been in my family more than 100 years—and it has been making money most of that time. It's making money today, with the help of a good rotation, deep soil that holds water, and plenty of fertilizer. My grandfather had a plow, an axe, a corn knife and a flail, a cradle and a scythe—plus some mighty well calloused hands. He and my dad farmed on their feet; I try to farm from my tractor seat. I've got more power, more machinery, better seed, bigger fields and less hired help. Best of all, I've got more fertilizer and I use it.

"My pastures aren't just exercise lots for my cows. Fertilizer makes the grass roots shoot up real feed. My corn and wheat fields aren't just exercise lots for me and my plow and combine or corn picker. They produce grain—and profits.

"I'm not seeding as much wheat land as I did three years ago. But a 40-acre lot with 8 tons of fertilizer turned out more profit in '56 than 60 acres with 3 tons of fertilizer in '55. That's why I'm putting 8 tons on 33 acres of wheat this fall. I used to stay about the state average with 25-bushel acre yields. This summer I got 36 bushels. With good moisture next winter, I figure to combine close to 1,300 bushels of wheat next July. And I'll make some money—without piling up any surplus grain.

"I'm feeding more corn than I sell. Except for a couple of real dry years, I've boosted my per-acre yield every year for the last 10 years. The right hybrid helps—but fertilizer really does the trick. This year I'm using about $32 worth of fertilizer per acre of corn. The way it's earing out, I should get a yield well over 100 bushels. This corn won't cost me more than 60 cents a bushel in the crib.

"Yes—I farm from where I sit on my tractor. From here, I can't figure out this year's farm program, or next year's. But I know I can grow crops cheaper when I use enough fertilizer. My County Agent says fertilizer is lower priced than anything else I buy to grow a crop. He says it's so and I know it works. Fertilizer, makes crops grow profits. That's what I'm interested in—acres that make me money—not acres that just keep me busy.

"Fertilizer pulled me through my toughest year—a drouth in '36. And I figure fertilizer will work better now, because I use more of it. Big acre yields with fertilizer help me squeeze down the cost per bushel—so I can squeeze out a better profit."

See Your County Agent

Ask your County Agent to recommend the analyses and the amounts of fertilizers best suited for your crops and soils. His advice to you is based on the latest official recommendations from your Extension Service and Experiment Station.

See Your Banker

Bankers are alert to good investments. They know that fertilizer pays a big return in bigger yields of better quality crops. If you need money to buy more fertilizer, talk it over with your banker.

See Your Dealer

Your fertilizer dealer can supply you with a good brand of fertilizer in the amounts and analyses as recommended by your County Agent. Help your dealer to get your fertilizer to you on time by placing your order early and accepting prompt delivery. It pays to have your fertilizer on hand when you need it. Remember, fertilizer grows farm profits. *Make sure you use enough this year!*

The fertilizer industry serves the farmer. Nitrogen Division serves the fertilizer industry as America's leading supplier of nitrogen for use in mixed fertilizers.

NITROGEN DIVISION ALLIED CHEMICAL

NITROGEN DIVISION Allied Chemical & Dye Corporation
New York 6, N. Y. • Hopewell, Va. • Ironton, Ohio
Omaha 7, Neb. • Indianapolis 20, Ind. • Columbia 1, S. C.
Atlanta 3, Ga. • Kalamazoo, Mich. • Columbia, Mo.

Fertilizer Grows Farm Profits

U. S. Borax Organization

Administrative offices of the new United States Borax & Chem. Corp. will be located at 630 Shatto Place, Los Angeles, Calif., according to J. M. Gerstley, president. P. J. O'Brien will serve as vice-president and general manager with Los Angeles as his headquarters.

New Operating Units

Four operating divisions have been created:

Pacific Coast Borax Co. Div.— J. F. Corkill, vice-president and general manager. Will continue borax manufacturing and sales in the industrial field with headquarters remaining for the present at 100 Park Ave., New York City.

United States Potash Co. Div.— Dean R. Gidney, vice-president and general manager. Responsible for production and sale of potash with headquarters continuing for the present at 30 Rockefeller Plaza, NYC.

When suitable arrangements can be made, these two divisions will be located together in new premises in New York.

20 Mule Team Products Div.— D. V. Parker, vice-president. Will handle sales and advertising of household products including industrial soaps and dispensers from a Los Angeles hq.

Research activities have also been organized under a separate division with G. A. McConnell, vice-president, and Dr. D. S. Taylor, director. A research center has been authorized and will be located on a site near Anaheim, Calif. Completion of the million dollar facility is expected around March, 1957.

Other Appointments

Other USB&C appointments: H. M. Albright, former head of U. S. Potash, special consultant; Paul Speer, vice-president and legal advisor; N. C. Pearson, vice-president, in charge of borax sales in overseas markets; R. F. Steel, secretary-treasurer; W. F. Dingley and W. A. Ackerman, assistant secretaries; and R. C. Dosta, assistant treasurer.

Allied Chem. Joins Pittsburgh Offices

Allied Chemical and Dye Corp. announced that the Pittsburgh sales offices of its General Chemical and Solvay Process Division have been consolidated at Gateway Center, Building No. 3, 401 Liberty Ave., Pittsburgh 22, Pa.

Yugoslavia Plant Contract to USSR

Yugoslavia has signed an agreement with the Soviet Union under which the USSR will build two fertilizer plants in the Balkan country.

The plants will have a capacity of 100,000 tons ammonia, 120,000 tons sulfuric acid and 250,000 tons superphosphate. All construction and technical aid will be on a turnkey basis.

Koppers Awarded IH NH_3 Contract

Koppers Co., Inc. has been awarded contracts for construction of a 32 ton/day ammonium sulfate unit at the Chicago plant of Wisconsin Steel Works, an International Harvester subsidiary.

A low-differential type ammonia absorber and auxiliary equipment will be built to replace present facilities with completion anticipated before the end of 1956.

Jan. Startup for St. Paul Ammonia

St. Paul Ammonia Products, Inc. is "hoping to meet a schedule of preliminary startup by Jan. 1" at its Pine Bend, Minn. plant, according to Frank W. Wilson, general manager.

Commenting in the St. Paul DISPATCH, Wilson added that a spur from the Chicago Great Western railroad has been run to the plant site where facilities will include two 2,500 ton ammonia storage spheres and two 2-million gallon ammonium nitrate fertilizer solution tanks. Engineering and construction of the facilities are being handled by the Lummus Co.

Midwestern Phos. Plans Wisc. Plant

A fertilizer plant will be erected by Midwestern Phosphate Corp. at Hull, Wisc. to serve farmers in the central portion of that state. Plant foods will be trade-named Kickapoo fertilizers and will be "krumbelized" as distinguished from granular or pelletized materials.

Costs of the Kickapoo Fertilizers plant, as it will be named, are estimated at over $100,000. R. B. Baldridge will manage the plant which is expected to employ 15 to 20 persons during the peak season.

Multi-Year Labor Contracts for IMC

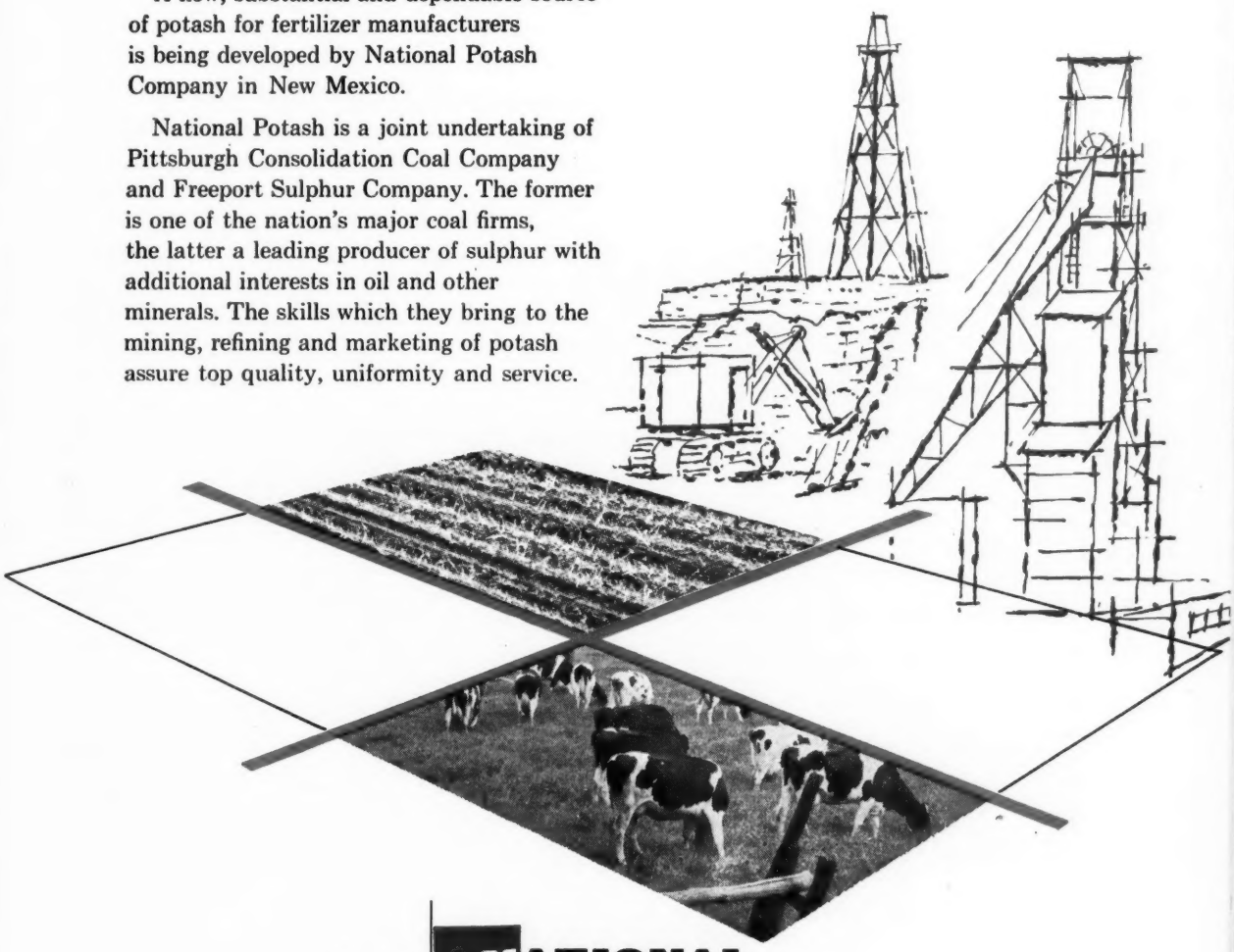
Seeking to avoid future shutdowns such as the lengthy walkout that afflicted its Florida phosphate plants last summer, International Minerals & Chemical Corp. has inked multi-year labor contracts.

The move to improve employee relations includes about 75 per cent of IMC mining and production workers under two to four year pacts.

a joint venture in Potash

A new, substantial and dependable source of potash for fertilizer manufacturers is being developed by National Potash Company in New Mexico.

National Potash is a joint undertaking of Pittsburgh Consolidation Coal Company and Freeport Sulphur Company. The former is one of the nation's major coal firms, the latter a leading producer of sulphur with additional interests in oil and other minerals. The skills which they bring to the mining, refining and marketing of potash assure top quality, uniformity and service.



NATIONAL POTASH COMPANY
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HIGH-K

MURIATE OF POTASH for the PLANT FOOD INDUSTRY

THIS symbol stands for high-grade coarse and uniform Muriate of Potash (60% K_2O minimum). Southwest Potash Corporation provides a dependable supply of HIGH-K* Muriate for the plant food industry.

*Trade Mark

Southwest Potash Corporation

61 BROADWAY ★ NEW YORK 6, N. Y.

Dow Gives $320,000 In Education Gifts

Educational gifts to institutions during 1956–7 by Dow Chemical Co. will total $320,000, it was announced by Dr. L. I. Doan, pres. The cash amount represents a nine per cent increase over the company's current program.

Arabs to Develop Dead Sea Potash

Arab League countries recently organized a company designed to exploit Dead Sea potash deposits. Cost of the venture is estimated at 12,500,000 dollars.

AP&C Adds New Trona Trademark

Wm. J. F. Francis, vice-president, American Potash & Chem. Corp, displays newly-designed Trona trademark (top) for complete AP&C line with the firm's former trademark.

Pan Am Sulphur to Increase Production

By September 1, production at the Veracruz, Mexico plant of Pan American Sulphur Co. is expected to increase by one million pounds a year, the result of a $1.5 million expansion program.

Since 1954 the company has produced over 700,000 tons of sulfur and expects to ship 500,000 tons this year.

best, by far, for *shipping and storing* ***fertilizers***

M/W MULTIWALLS *by* **CHASE BAG**

there's nothing better!

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CHASE BAG COMPANY General Sales Offices: 309 W. Jackson Blvd., Chicago 6, Ill.

Personal Service and Prompt Shipments from 32 Nation-wide Branch Plants and Sales Offices

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Fert. Barges for Puerto Rico Firm

Gonzales Chemical Industries, Inc., San Juan, Puerto Rico, has contracted two special barges from the Dravo Corp. for transporting chemical fertilizers to be used on sugar cane, tobacco and other crops in Puerto Rico and the West Indies.

Scheduled for fall completion, the barges will be towed from Dravco's Pittsburgh, Pa. plant to New Orleans for final delivery. Each is designed to hold up to 1,575 tons of ammonium sulfate, anhydrous ammonia, sulfuric acid and other products.

Flies Resistant to Phos. Compounds

Phosphorous resistant house flies have been reported in SCIENCE. J. Keiding of the government pest infestation laboratory Sprinforbi, Denmark, made the announcement after experimenting with parathion, Diazinon and Bayer 21/99.

Agriculture Loses Million Acres Year

Over a million acres a year of tillable land is being taken out of agricultural production, says SCS Administrator Donald A. Williams, for use in urban subdivisions, industrial sites, defense establishments, highways, railroads and airports.

During the past 15 years, he reports, about 17 million acres of our top farmlands have been converted to these non-agricultural uses, some three fifths of it for private development. The figure represents nearly three per cent of all US land considered suitable for cultivation.

La. Charter Issued

Poultry By-Products, Inc., 4001 S. Carrollton Ave., New Orleans, La., has obtained a charter to manufacture fertilizer. Authorized capital is 1,000 shares no par stock.

Panel Featured on NAC Fall Program

National Agricultural Chemical Assn.'s annual meeting, scheduled for Spring Lake, N. J. on September 6–7 will feature a discussion on what influences growers to buy and use pesticides. The panel will include representatives from the farm press, pesticide dealers, formulators, extension service and radio.

AAI Reports Big Gain in NH_3 Sales

Sales of ammonia increased 17 per cent from January to May, 1956, compared to the 1955 period, according to the Agricultural Ammonia Institute.

A survey of AAI distributor members in 25 states and Canada shows the increase equalled that of 1955. NH_3 direct application accounts for about one fifth of domestic nitrogen fertilizer consumption, estimates the AAI, with 1955–56 usage expected to total 460,000 tons.

Peru Guano Firm Adds Floating Lab

Peru's Administrative Guano Co. now has a new fishing boat designed for use in marine studies and equipped with a modern laboratory for hydrographic studies.

The firm is a government agency engaged in developing guano resources in Peru and on off-shore islands.

Rutgers Ent. Grant From Trubek Labs

Trubek Laboratories, Inc. has established at Rutgers University, a $2,500 fellowship for basic research in entomology.

Rutger's Dr. Bailey B. Pepper, chairman of the college and experiment station entomology department, stated that the grant will strengthen work in basic research with insects.

Oct. Stockholder Meetings for Dow

Directors of Dow Chemical Co. have announced that future stockholder meetings will be held in September instead of August. The meeting date was moved back because of the increasing complexity of company business, and to provide more time for preparation of the annual report.

O-M Wheat Belt Special

Olin-Mathieson's "Wheat Belt Special," a 68-car train load of high analysis pelletized fertilizer arrived at Omaha, Neb. on June 20. It was the first full train of mixed goods and the largest shipment of plant food to enter the area. Local dealers aided in welcoming ceremonies.

HOW UNION BAG BUILDS MORE BUSINESS FOR THE FERTILIZER INDUSTRY

"For 10 years I've bought fertilizer only in Multiwalls"

Raymond Rossback, farmer, Davidsonville, Maryland.

"See how correct fertilizing pays off?" says Mr. Rossback. "This is Southern Maryland cigarette tobacco, Type 32, of fine texture and quality. I fertilize heavily to grow it, from 1,000 to 1,500 lbs. per acre. I use 80-lb. Multiwalls, hand-pouring the fertilizer into the spreader machine, then out to the fields. That's the easiest and most practical way to do the job."

Union Bag information program promotes fertilizer

Mr. Rossback took over his property in 1911, when it was practically a wilderness. Neighbors said, "You won't last long." They were wrong; good management and the proper use of fertilizer, plus hard work, won out. To help farmers like Mr. Rossback, Union Bag stresses those themes in a countrywide educational program.

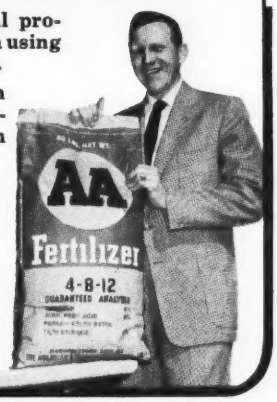
Union's information program helps build sound and expanding farm markets for fertilizer distributors. Union's Multiwalls, used by top fertilizer companies, lighten farm chores and create satisfied farm customers. The strong, attractive Multiwall pictured below was designed and made by Union for The American Agricultural Chemical Company.

"Union Bag's educational program should aid farmers in using fertilizer more efficiently.

Union Multiwalls have an excellent performance record with us. We use them in quantity."

Mr. John A. Layton, Superintendent, Baltimore Plant, American Agricultural Chemical Company, Baltimore 24, Maryland.

The American Agricultural Chemical Company is one of the country's leading fertilizer manufacturers, distributing AGRICO, AA Fertilizers and 18% Normal Superphosphate.

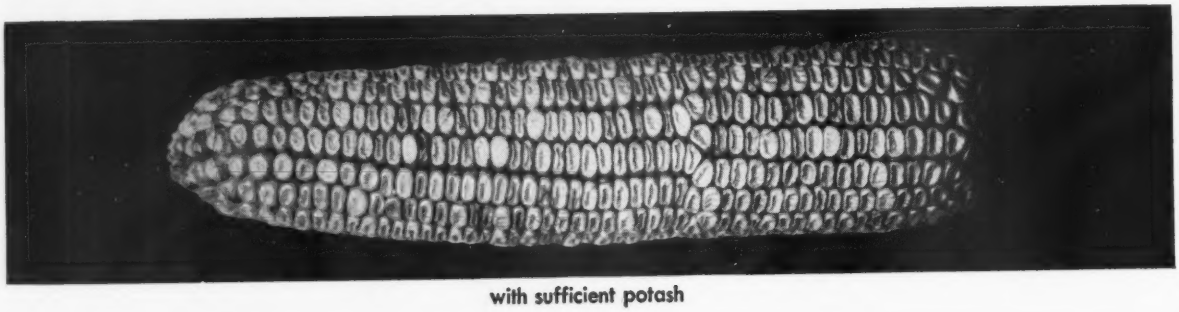


UNION Multiwall Bags

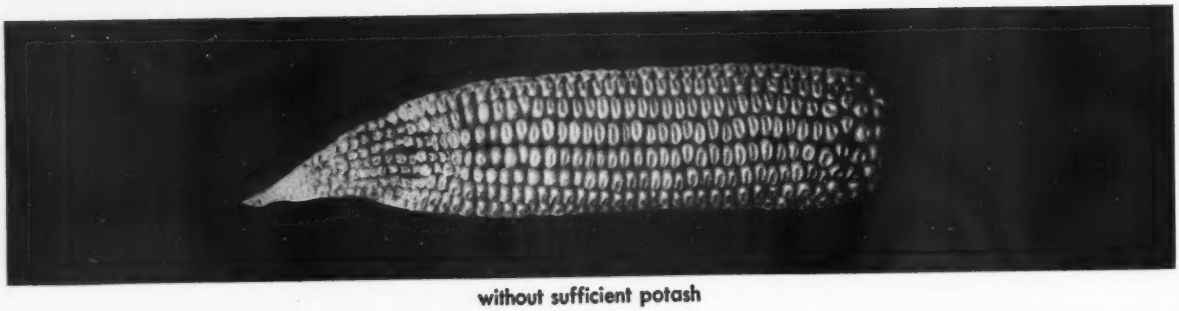
TRADE MARK UNION

UNION BAG & PAPER CORPORATION · WOOLWORTH BUILDING, NEW YORK 7, N. Y.

IN CORN, POTASH-ENRICHED FERTILIZERS MAKE THE DIFFERENCE



with sufficient potash



without sufficient potash

More and more farmers are learning that it requires balanced fertilizers to produce healthier, more vigorous crops. Potash, an essential ingredient of these balanced fertilizers, increases plant resistance to disease and improves both yield and crop quality.

USP's high-grade muriate of potash has the highest K_2O content and is free-flowing and non-caking—important advantages in the manufacture of these modern fertilizers which help American farmers to better crops and better incomes.

UNITED STATES POTASH COMPANY

DIVISION OF UNITED STATES BORAX & CHEMICAL CORPORATION

30 Rockefeller Plaza, New York 20, N. Y.

Southern Sales Office
Rhodes-Haverty Building, Atlanta, Georgia

SUNSHINE STATE POTASH A PRODUCT OF NEW MEXICO U.S.A.

REG. U.S. PAT. OFF.

HIGRADE MURIATE OF POTASH 62/63% K_2O

GRANULAR MURIATE OF POTASH 60% K_2O MIN.

New Management for V-C

Results of a stockholder vote on July 18 ended a bitter fight for control of Virginia Carolina Chem. Corp., outsting former president J. A. Howell and six of his fellow directors. William Franklin is acting as president pro tem. until the board of directors meets on August 7 or 17.

New members of the board, in addition to R. T. Zickle, leader of the incoming group include:

Wm. Franklin	A. Thelen
J. C. Bolles	J. S. Battle
S. Roesler	S. W. Fredrick

It appears that, under the new management, an analysis of V-C fertilizers sales will be the first move. Indications are that a complete study will be undertaken to learn why sales and earnings have been dropping steadily in relation to V-C's competition. Included in the project will be an examination of the firm's raw material cost position, said to run high in relation to that of competitors.

Equally important will be an effort to develop a better profit margin relationship through upgrading of products. Possibilities will be sought in phosphorous—one raw material in which the company is basic.

It is felt that, with increased upgrading of phosphorous materials, V-C may best bolster its earnings picture.

Another area of investigation may involve potash supplies, currently purchased entirely from outside sources. Entry of V-C into this raw material market is a possibility.

Under the past management, it is said that manufacturing properties have deteriorated to a point of inefficiency. It will be up to the new president and his advisors to decide whether present units should be repaired or closed to permit construction of new facilities in areas offering the greatest potential market.

On the financial side, V-C's new management is faced with a 38 million dollar dividend arrears on its cumulative preferred stock.

Legislation prior to the current year required a 90 per cent vote of preferred stockholders for recapitalization and an effort to gain this position failed in 1949. This year the Virginia legislature passed a new law requiring approval of only 51 per cent of the shareholders. Jumping this lower hurdle may well place V-C back on the road to recovery.

MORE for your money!
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WIRE CLOTH & SCREEN
Whether selected from hundreds of sizes and weaves in stock—or woven specially to specifications—
L-S Screens and Cloth give better resistance to wear, distortion, vibration, heat and corrosion—
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Sales Offices: Birmingham, 1727 Sixth Ave. North; Chicago, 5807 W. Diversey; Pittsburgh, Union Trust Building; Houston, 1213 Capitol Ave.
West Coast: Star Wire Screen & Iron Works, Inc., 2515 San Fernando Rd., Los Angeles; Subsidiary, Ludlow-Saylor Wire Cloth Co.

Geigy Offices, Labs To Yonkers Address

On August 1, Geigy Chemical Corp. was scheduled to move its offices and laboratories to Ardsley, N.Y., where administrative offices and lab facilities have been constructed on a 25 acre tract.

New mailing address: Geigy Chemical Corp., P. O. Box 430, Yonkers, N. Y.

GLF Pays Member Soil Testing Fees

Under a plan recently announced by Cooperative GLF Exchange, farm members of the organization can submit soil samples to state college laboratories with fees to be paid by GLF beginning July 1. Over 120,000 New York, New Jersey and Pennsylvania farmers will be eligible.

Cornell and Penn State currently charge one dollar per sample and Rutgers, offering free tests in the past, will begin charging a similar fee on January 1, 1957.

DDT Picture Good Reports Montrose

A healthy picture of DDT sales is reported by Montrose Chemical Corp. of California with all production, through the current month, already contracted. According to Pincus Rothberg, head of the concern, operations continue at full capacity.

Current output of the insecticide is said to be ahead of 1955 production, which totaled 48,500,000 lbs. for the full year.

A. B. Pettit launching the first company-wide safety campaign for W. R. Grace & Co. divisions and subsidiaries. Plans were formulated for improved safety techniques.

Australia's First NH_3 Plant Operating

Australia's first ammonia plant went on stream in late July at Hobart. A by-product factory of Zinc Co. of Australasia, Ltd. and located at the Risdon Zinc Works, it will produce 55,000 annual tons—over half of the country's yearly requirements.

Most of the output will be shipped as fertilizer to Queensland and northern New South Wales for use on sugar cane.

Canada Sales Agent Selected by MGK

Allied Basic Chemical Co., Ltd., Toronto and Montreal, has been named Canadian agent for McLaughlin Gormley King products.

Grace Inaugurates Safety Campaign

A company wide safety campaign designed to coordinate safety activities has been inaugurated by W. R. Grace & Co. Prior to this all such work was carried out individually by each of the Grace divisions and subsidiaries.

Heading up the program is A. B. Pettit as director of industrial health and safety. Former safety administrator of Davison Chemical Co., Pettit is an industrial safety expert with broad experience and has frequently assisted in the investigation of industrial mishaps, including the Texas City disaster.

Production Slowed In Western Fields

Greater than seasonal slump in fertilizer sales shut down production at one plant in the Western phosphate field and a second firm planned to suspend production in July.

A partial shutdown of J. R. Simplot's fertilizer division in Caribou county, Idaho, began July 1, according to the Pocatello SUNDAY JOURNAL although some portions of the manufacturing facilities continued to operate. W. Grant Kilbourne, general manager, reports that the halt would have been called regardless of economic conditions for vacations and maintenance.

Anaconda Copper Co. mine and mill operations at Conda were scheduled to close on June 14 and were not expected to resume until late October.

Reports from Monsanto Chemical Co. and Westvaco Mineral Products Div. indicated that their facilities would continue to operate on current schedules.

Stauffer Adds to Chauncey Center

At Chauncey, N. Y. a new wing has been added to the Stauffer Chemical Co. chemical research center. The addition more than doubled floor space at the lab.

Agency for Flo-Mix

Flo-Mix Fertilizers Corp., Houma, La. and Chicago, Ill., has named Jown W. Shaw Advertising, Inc., Chicago, to handle all advertising.

Kerley Chemical Corp.

Kerley Chemical Corp. is the new name for the former Southwest Fert. & Chem. Co. of Imperial, Calif.

. . . loading is smooth and there's a scooping action with tip-back bucket.

. . . mobile ramp is pulled from bin to bin by the Tracto-Loader.

SAVES 21 MAN-HOURS UNLOADING BOXCAR

with compact TRACTOMOTIVE TL-6 TRACTO-LOADER— a high producer in confined areas

A boxcar of bulk materials is now unloaded in two to three hours with a TL-6 Tracto-Loader at Cambridge Tile Manufacturing Co., Cincinnati, Ohio — manufacturer and national distributor of Suntile, a fine clay tile for homes and industrial buildings. This includes the time it takes to spot a mobile ramp and set up a portable belt conveyor and hopper. The former hand labor method took 24 man-hours to empty a car!

The mobile ramp is pulled from bin to bin by the Tracto-Loader . . . then this compact, half-yard machine drives up the ramp and makes a right angle turn over a bridge into a boxcar. Its short, 6½-foot turning radius enables it to scoot around easily in the car. There's no time-consuming gear shifting, either — a pull or push on a single lever changes direction of loader.

The TL-6 gets big loads and delivers 'em to hopper fast. Instead of ramming to get load, operator lets the hydraulic torque converter do the crowding. It's smooth and positive . . . and there is a scooping action with the tip-back bucket. The full load is tucked in close to the cowl with the 50-degree tip back of bucket and carried low — means greater stability, better visibility, easier maneuvering.

See how the TL-6 can speed up the handling of bulk materials in your plant — even in the most confined areas. Arrange with your Allis-Chalmers Construction Machinery Dealer for a demonstration.

SOLD AND SERVICED BY YOUR ALLIS-CHALMERS CONSTRUCTION MACHINERY DEALER

Send For Free Descriptive Catalog On The Complete Line Of Tracto-Loaders ▶

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☐ Send catalog on Tracto-Loaders

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Company .....
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DON'T SIGN THAT ORDER!

SAVE MONEY ON 1956 NITROGEN CONTRACTS

Freight represents a high percentage of your costs for nitrogen solutions, anhydrous ammonia and aqua ammonia. The completion of Sinclair's strategically located new plant in Hammond, Indiana, means a sharp reduction in freight costs for many nitrogen users located in the Mid-West.

Here's another big advantage! Sinclair's new facilities and vast new storage capacity make it possible to meet *your* production schedule – even during peak season. Two tank car fleets are held in readiness – one for exclusive use in shipping anhydrous ammonia, the other for nitrogen solutions.

So don't sign that contract... first find out how this new Sinclair plant in the heart of the Mid-West can cut your costs and delivery time of nitrogen supplies. Write or telephone...

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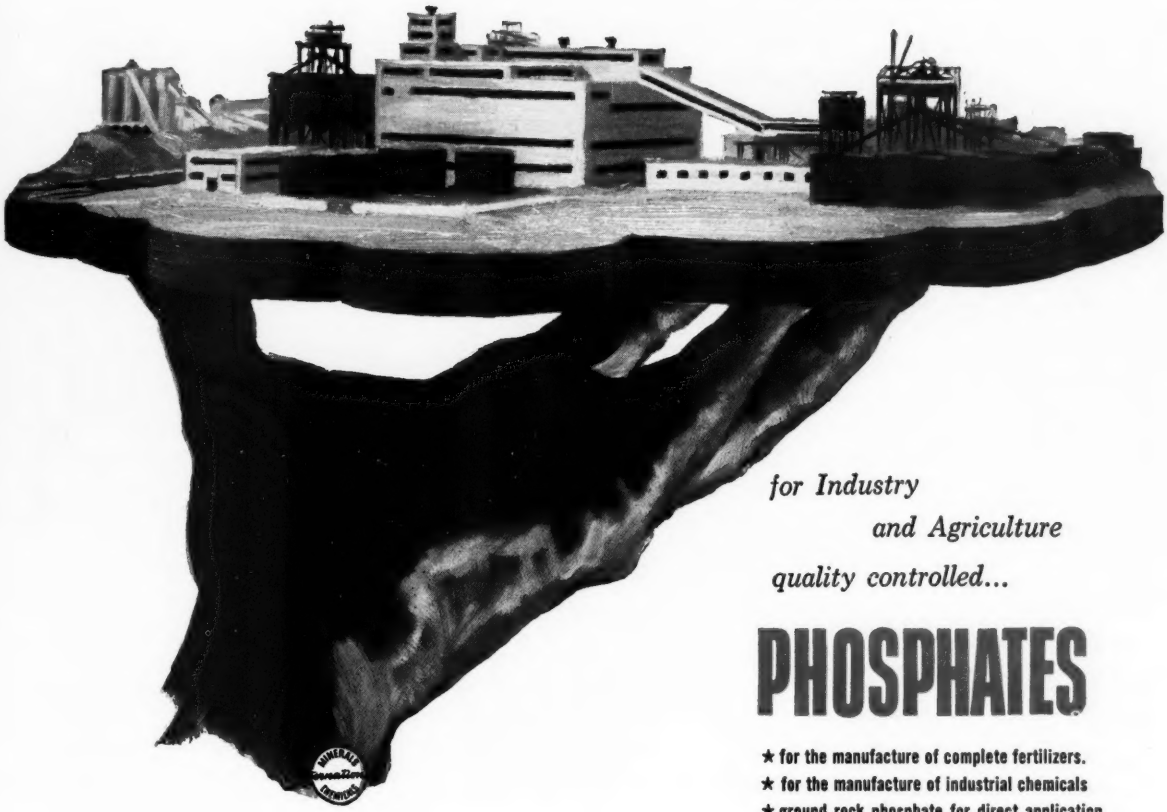
When dealers and farmers are screaming for fertilizers and dry mixing plants are pushing for superphosphates, you can be sure that *International* will meet your toughest schedules for deliveries of quality-controlled phosphate. For here at *International* we have the resources and facilities to meet your demands. Six big mines and plants. Huge storage capacity. A full range of grades of *quality-controlled phosphates.* And the ability to handle routine or emergency orders on time.

WHEN THE PRESSURE IS ON

here are resources to help you



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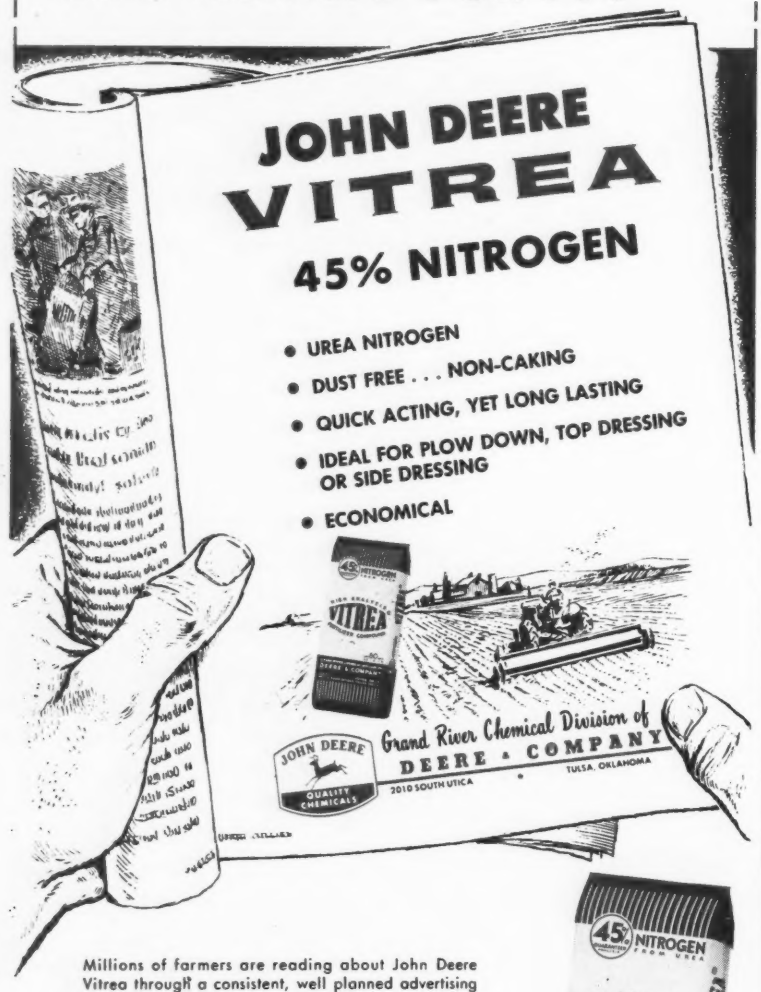
Phosphate Mines and Plants in Florida at Noralyn, Peace Valley, Achan, Mulberry; in Tennessee at Mt. Pleasant and Wales.

FARMERS EVERYWHERE

ARE READING ABOUT AND ASKING FOR . . .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AVOID THE RUSH . . .
ORDER VITREA OR ANHYDROUS AMMONIA NOW!

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Grand River Chemical Division of
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2010 SOUTH UTICA • TULSA, OKLAHOMA

Calendar

Aug. 14-15. Ohio Pesticide Institute, summer meeting, Ohio Agr. Expt. Station, Wooster.

Aug. 17-25. Tenth International Congress of Entomology, McGill University & Univ. of Montreal, Montreal, Canada.

Aug. 22-24. Beltwide Cotton Mechanization Conf., Atlanta Biltmore, Atlanta, Ga. (Sponsored by National Cotton Council).

Aug. 30. S. C. Plant Food Educational Society Fall Convention, Clemson House, Clemson, S. C.

Sept. 5-7. Nat'l. Agricultural Chemicals Assn. 23rd annual meeting, Essex and Sussex, Spring Lake, N. J.

Oct. 9. Western Agricultural Chem. Assn. Fall Meeting, Villa Hotel, San Mateo, Cal.

Oct. 15. Fifth annual chemical sales clinic sponsored by Salesmen's Assn. of the American Chemical Industry, Hotel Commodore, New York City.

Oct. 16-17. National Nitrogen Solutions Assn. annual meeting and trade show, City Auditorium, Sioux City, Iowa.

Oct. 16-18. Fert. Ind. Round Table, Shoreham Hotel, Washington, D. C.

Oct. 18-19. Assn. of American Fert. Control Officials meeting, Shoreham Hotel, Washington, D. C.

Oct. 23-24. Pacific N. W. Garden Supply Trade Show, Shrine Auditorium, Portland, Ore.

Oct. 22-26. 44th National Safety Congress and Exposition, sessions in Conrad Hilton, Congress, Morrison and La Salle Hotels, Chicago.

Oct. 25. Mid-West Soil Improvement Committee, Sherman Hotel, Chicago, Ill.

Nov. 2. Joint Agronomy Industry Work Conference, Atlanta Biltmore Hotel, Atlanta, Ga.

Nov. 7-9. Agr. Ammonia Institute Annual Convention, Atlanta Biltmore Hotel, Atlanta, Ga.

Nov. 7-9. Pacific Northwest Plant Food Assn. Annual Convention, Harrison Hot Springs Hotel, Harrison Hot Springs, B. C.

Nov. 11-13. Calif. Fert. Assn., 33rd Annual Convention, Del Coronado Hotel, Coronado, Cal.

Nov. 19-20. Eastern Branch, Ento. Society of America, Hotel Haddon Hall, Atlantic City, N. J.

Nov. 27-28. Indiana Fert. Conf., Memorial Union Bldg., Purdue University, Lafayette, Ind.

Nov. 28. Okla. Fert. Dealers Conf., Okla. A & M College, Stillwater, Okla.

Nov. 29. Okla. Soils and Crops Conf., Okla. A & M College, Stillwater, Okla.

PEOPLE

American Agricultural Chemical Co. Two new division superintendents: R. M. Richey for the Western Div. and H. B. Houghtaling for the Southeastern Div. Richard R. Benson has been named assistant manager of the Cleveland sales office.

American Chemical Paint Co. Gerald C. Romig succeeds Leon Cherksey as president, and Cherksey becomes chairman of the board. Romig went to ACP in 1927, and his experience of almost 30 years includes 18 years in the Research and Development Dept. and 11 years as vice president.

Cherksey is the first officer in the company's history to serve in this new capacity. He joined the firm in 1919, became secretary-treasurer in 1930, and in 1939 was named president.

American Potash & Chemical Corp. Daniel S. Dinsmoor, former vice president in charge of research and development, has been named vice president in charge of planning and development for AP&C, and Joseph C. Schumacher has been elevated to vice president in charge of research.

Dinsmoor

Schumacher

Schumacher, who joined American Potash in 1954, will head a new department which centers research functions at the Trona, Whittier and Los Angeles, Calif., and Henderson, Nev., installations.

Harold Mazza has been appointed manager of research at the firm's Los Angeles plant.

Atlas Powder Co. Appointment of Dixon C. Van Winkle as field sales manager for the Chemical Div. recently was announced. Van Winkle, who has been manager of the New York chemicals sales office, now will headquarter at Wilmington. He is succeeded at New York by Henry C. S. Swab, former technical representative at San Francisco.

Commercial Solvents Corp. Thomas B. Potter, assistant to the Petrochemicals Div. vice president, has been named secretary and assistant treasurer of Northwest Nitro-Chemicals, Ltd., a Canadian affiliate. His headquarters will be transferred from New York to Northwest Nitro's new $22 million plant, now under construction at Medicine Hat, Alberta, Canada.

Potter

Newly appointed western manager for CSC's Market Development Dept. is Eugene M. Seidel, previously Midwest field representative. He is replaced as field rep by Marion E. Tislow, who will locate at Terre Haute, Ind.

Diamond Alkali Co., Electro Chemicals Div. promotions: Lloyd R. McCoy, to supervisor of the Technical Service Section; and Warren Dusenbury, to divisional staff assistant on caustic soda sales.

Dow Chemical Co. As part of its technical service and development, Dow has formed a Wood and Construction Section, headed by George E. Olson. The section will be responsible for development of applications for both new and established chemicals in the wood and construction fields and will handle sales service on chemical products now used in wood treatment. H. M. Tobey and H. A. Huber have been named to work with Olson.

Escambia Bay Chemical Corp. Lester Ginsburg, vice president of Electric Bond and Share Co., has been elected to the board of directors. Escambia Bay is owned jointly by Electric Bond and Share, United Gas and National Research Corp.

Ginsburg

A. E. New has been named director of the Technical Dept. in the firm's Manufacturing Div. He goes to the firm from Carbide and Carbon Chemical Co.'s Texas City plant, where he was director of process development. He will be responsible for process design and engineering projects, starting with pilot plant data through full plant scale operation.

Food Machinery and Chemical Corp. Top management shifts: Ernest Hart, former executive vice president in charge of chemical divisions, has been elected president; Dr. Carl F. Prutton is new executive vice president in charge of chemical divisions; James M. Hait and

Hart

Prutton

Loeffler

. . . People

John D. Fennebresque were elected executive vice presidents; Jack M. Pope, financial vice president and Alfred T. Loeffler, vice president.

Hercules Powder Co. executives realigned: Paul Mayfield was recently elected a vice president and member of the executive committee. Vice President J. B. Johnson has resigned from the executive committee, but continues as a board member and vice president. G. Fred Hogg succeeds Mayfield as general manager of the Naval Stores Dept.

International Minerals & Chemical Corp. Appointment of Anthony E. Cascino as director of marketing has been announced by T. M. Ware, administrative vice president. Cascino goes to International from AVCO Manufacturing Co. where he served as director of marketing. In his new position he will be responsible for coordination of the firm's six divisions in areas of advertising, sales, merchandising and market research.

Cascino

Minerals & Chemicals Corp. of America. C. Y. Haas has been appointed manager of sorptive mineral sales.

Goering

National Potash Co. Charles W. Goering has joined NP as sales representative for the northeastern states. A graduate of Wabash College and Harvard Business School, he has served for three years in the Navy. Goering will work out of the company's New York offices.

Olin Mathieson Chemical Corp. INSECTICIDE DIV. Newly named manager of operations is Benton H. Wilcoxon. W. B. Jordan, former head of market development, is now manager of the Western sales district. Prior to joining Olin Mathieson, he was entomologist and technical representative for other leading pesticide manufacturers in California. His headquarters are at Fresno, Calif.

Wilcox

The div. has expanded its Technical Service Dept. to include responsibilities formerly handled in the Market Development Dept. Kenneth B. Nash, former manager of technical service, will head the combined department.

Nash

PLANT FOOD DIV. Harold E. Clark has been appointed manager of advertising and sales promotion at Houston, Tex. He had been manager of the Agricultural Dept., Houston Chamber of Commerce.

Pennsylvania Salt Mfg. Co. Frederick R. Anspach succeeds S. R. Coale, who has resigned, as sales manager of the Thomas Fertilizer Div. Anspach joined the Thomas organization as a soil chemist in 1939. He was a member of the sales staff for eight years, and has been in charge of domestic sales since January, 1956.

Anspach

Pennsylvania Salt Mfg. Co. of Wash. Peter J. Stupin has been appointed to the western sales group. With headquarters at the Los Angeles offices, he will cover the southern California territory. Before joining Pennsalt Chemicals, Stupin served as research director for Calavo Corp.

Stupin

Stauffer Chemical Co. Newly named plant manager at Freeport, Tex., is Howard L. Cromwell, succeeding Richard Owen, who is now production manager, Eastern Agricultural Chemicals Div. Cromwell joined Stauffer in 1947, has served as manager of the Harvey, La., plant and most recently has been engaged in process development work at the Niagara Falls plant.

LeRoy Rau has been named to handle the Agricultural Chemicals Div.'s complete line of chemicals in the Midwest territory. With headquarters at the Omaha office, Rau will cover western North Dakota, South Dakota, Nebraska, southeast Wyoming and northeast Colorado. He had been with Chester B. Brown Co. and its subsidiary, Brown Farm Chemical Co.

Rau

The Texas Co. Robert W. Sanders has been appointed supervisor of chemical operation at the firm's ammonia plant, now under construction at Lockport, Ill. Sanders joined the company in 1932 upon graduation from Texas A & M College.

5 PHILLIPS

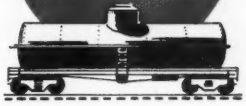
Fertilizer Materials for High Analysis Mixtures

1

AMMONIUM SULFATE

New Premium Quality Phillips *66* Ammonium Sulfate contains 21% nitrogen, 23.8% sulfur. It is *dry*-cured to remove excess moisture, prevent caking. Uniform dust-free crystals flow freely, mix easily. Ideal for all analyses of mixed goods and for direct application. Available in bags or bulk.

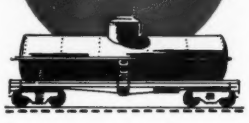
2



ANHYDROUS AMMONIA

Phillips *66* Agricultural Ammonia contains 82% nitrogen. It's a convenient, economical source of nitrogen for formulation of mixed goods. Tank car shipments are assured to Phillips contract customers by Phillips huge production facilities in the Texas Panhandle and at Adams Terminal near Houston.

3



NITROGEN SOLUTIONS

Get more N per dollar! There are three Phillips *66* Nitrogen Solutions for use in preparation of high-analysis fertilizers and the ammoniation of superphosphate. These solutions help to keep manufacturing costs low; help rapid, thorough curing.

4

AMMONIUM NITRATE

Phillips *66* Prilled Ammonium Nitrate contains 33.5% nitrogen. The small, coated prills resist caking, handle easily. Depend on Phillips *66* Prilled Ammonium Nitrate for uniform free-flowing properties and top-notch crop response as a direct application material. It's an ideal companion high nitrogen fertilizer for your quality mixed goods.

5

TRIPLE SUPERPHOSPHATE

Phillips *66* Triple Superphosphate contains 46% available phosphoric acid. Ideal for use in formulation of high-analysis fertilizers.

Phillips 66

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BARTLESVILLE, OKLA.—*Adams Bldg.*
CHICAGO, ILL.—*7 South Dearborn St.*
DENVER, COLO.—*1375 Kearney Ave.*
DES MOINES, IOWA—*606 Hubbell Bldg.*
HOUSTON, TEX.—*1020 E. Holcombe Blvd.*
INDIANAPOLIS, IND.—*1112 N. Pennsylvania St.*
KANSAS CITY, MO.—*500 West 39th St.*
MINNEAPOLIS, MINN.—*212 Sixth St. South*
NEW YORK, N. Y.—*80 Broadway*
OMAHA, NEB.—*WOW Building*
PASADENA, CALIF.—*330 Security Bldg.*
RALEIGH, N. C.—*804 St. Mary's St.*
SALT LAKE CITY, UTAH—*68 South Main St.*
SPOKANE, WASH.—*521 E. Sprague*
ST. LOUIS, MO.—*4251 Lindell Blvd.*
TAMPA, FLA.—*3737 Neptune St.*
TULSA, OKLA.—*1708 Utica Square*
WICHITA, KAN.—*501 KFH Building*

Associations & Meetings

WACA to Meet at San Mateo, Calif.

Scene of the Western Agricultural Chemicals Association fall meeting on Oct. 9 will be the new Villa Hotel in San Mateo, Calif.

Scheduled are talks by Harvey O. Banks, director, Calif. Water Resources Board; Allen F. Mather, executive secretary, Agricultural Council of Calif., and H. C. Moore, president, Agricultural Aircraft Association, Inc. of Calif.

Safety Talks Book For Foremen Published

The National Safety Council has just released a new volume of "Five-Minute Safety Talks for Foremen." Written by Roland Blake, the book contains 52 talks designed to build sound attitudes on accident prevention.

For further information and prices, write NSC, 425 N. Michigan Ave., Chicago 11, Ill.

Topic Announced for Cotton Conference

Fundamental research into soil, water and plant relationships will be a major topic at the second annual Beltwide Cotton Production Conference, National Cotton Council reports.

The conference, to be held in Birmingham, Ala., Dec. 13-14, will be sponsored by NCC, land-grant colleges in the Cotton Belt, USDA, the chemical industry, farm organizations and others.

NAC Assn Releases New Safety Leaflet

A leaflet containing 12 simple suggestions for the safe handling of chemical dusts and sprays has been released by the National Agricultural Chemicals Association as part of an expanded NAC-Industry safety education program.

Copies will be made available to NAC Association members for distribution to farmers and farm groups.

PNPFA Will Convene in British Columbia

The Pacific Northwest Plant Food Association has set Nov. 7–9 for its annual convention, to be held at the Harrison Hot Springs Hotel, Harrison Hot Springs, British Columbia.

Bob Allard of Wilbur Ellis Co. is general convention chairman, and Lee Fryer, Chas. H. Lilly Co., program chairman.

Ga. Group's Contest Banquet Draws 200

About 200 people attended the Grazing System and Forage Production Contest Awards Banquet held in Atlanta, Ga. in May, the Georgia Plant Food Educational Society reports. Sponsored by the society and conducted by the extension service, the contest costs the group an estimated $2,500 annually.

Ralph Johnson, extension entomologist, told GPFES directors that more than 100 county-wide meetings on pastures were held in the Spring of 1956, and information furnished by the grazing system contest was used by the extension staff.

NSC Film Directory

The 1956 National Directory of Safety Films, providing information on 1,200 films on safety, first aid, fire prevention and civil defense, is now available from the National Safety Council. Single copies of the directory may be purchased for $1 from the council, 425 N. Michigan Ave., Chicago 11, Ill.

Atlantic City Site For ACS Sept. Meet

A two-day symposium on "Chemicals in Food Production" will be presented by the Div. of Chemical Marketing and Economics at the American Chemical Society's national meeting in Atlantic City, Sept. 18.

Hugo Riemer, president, Nitrogen Div., Allied Chem. & Dye Corp., is general chairman for the symposium, which includes four one-half day symposia on important areas related to the chemical fertilizer industry; research and development, production, sales and end use patterns of pesticides; developments in the use of synthetic nitrogen materials as feed supplements; and important considerations related to the Pure Food and Drug Laws.

A dinner is planned for Monday, Sept. 17, to be jointly sponsored by the Agricultural and Food and the Chemical Marketing and Economics Divs. of ACS.

AAFCO Confab Set for Oct. 18-19

The Association of American Fertilizer Control Officials will meet in Washington, D. C. at the Shoreham Hotel on Oct. 18 and 19. For further information write to B. D. Cloaninger, secretary-treasurer, Drawer 392, Clemson, S. C.

Burgess to Address Chem. Sales Clinic

Assistant Secretary of Defense Carter L. Burgess will be luncheon speaker at the fifth annual Chemical Sales Clinic being held at the Hotel Commodore, New York Ciry, on Oct. 15, 1956.

During the morning session talks will deal with key problems in sales. Program for the afternoon includes three panel sessions, on supervision of salesmen, improvement of reseller-manufacturer relations and communications between sales and management.

Speeds cycles, cuts bulk handling costs . . .

Only the MICHIGAN 12B gives you a power-shift transmission

Power-shift transmission is standard equipment on the 15 cu. ft. MICHIGAN Model 12B—no engine clutch, no pedal, no gear clash. MICHIGAN is the only Tractor Shovel in this size range with power-shifting. Instead of wrestling with a conventional shift-lever and clutch pedal, the operator simply pushes a single lever on the steering column—like a modern car. High, low or reverse—make any shift instantly, even when travelling.

Entirely new power-train. For the constant stop-and-go, forward-reverse cycles of industrial bulk handling, Clark has designed and built an entirely new power-train for the Model 12B. This exclusive power-train is a completely integrated package, with each component matched to the others:

Torque converter multiplies engine torque up to 300%—provides the extra push to climb grades or penetrate tight material.

Power-shift transmission makes all shifts hydraulically—cuts vital seconds off every cycle.

Planetary-wheel drive axle takes 70% of the torque load off the axle shaft—eliminates broken axles.

Not only does this power-train package make the MICHIGAN faster and easier to operate, it eliminates all the maintenance associated with an engine clutch and pedal. Furthermore, you deal with one single source for design, manufacture and service of all basic components.

Make your own comparison. The MICHIGAN Model 12B is simply more machine than any Tractor Shovel in its class. It is heavier and more powerful; it has low-level bucket action, complete dust protection features, and the exclusive Clark power-train. Before you buy an industrial Tractor Shovel, see this one in action. Write to arrange a demonstration of the MICHIGAN Model 12B on any job you name; clip the coupon to your letterhead and we'll do the rest.

Michigan is a registered trade mark of

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Construction Machinery Division
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Benton Harbor 30, Michigan

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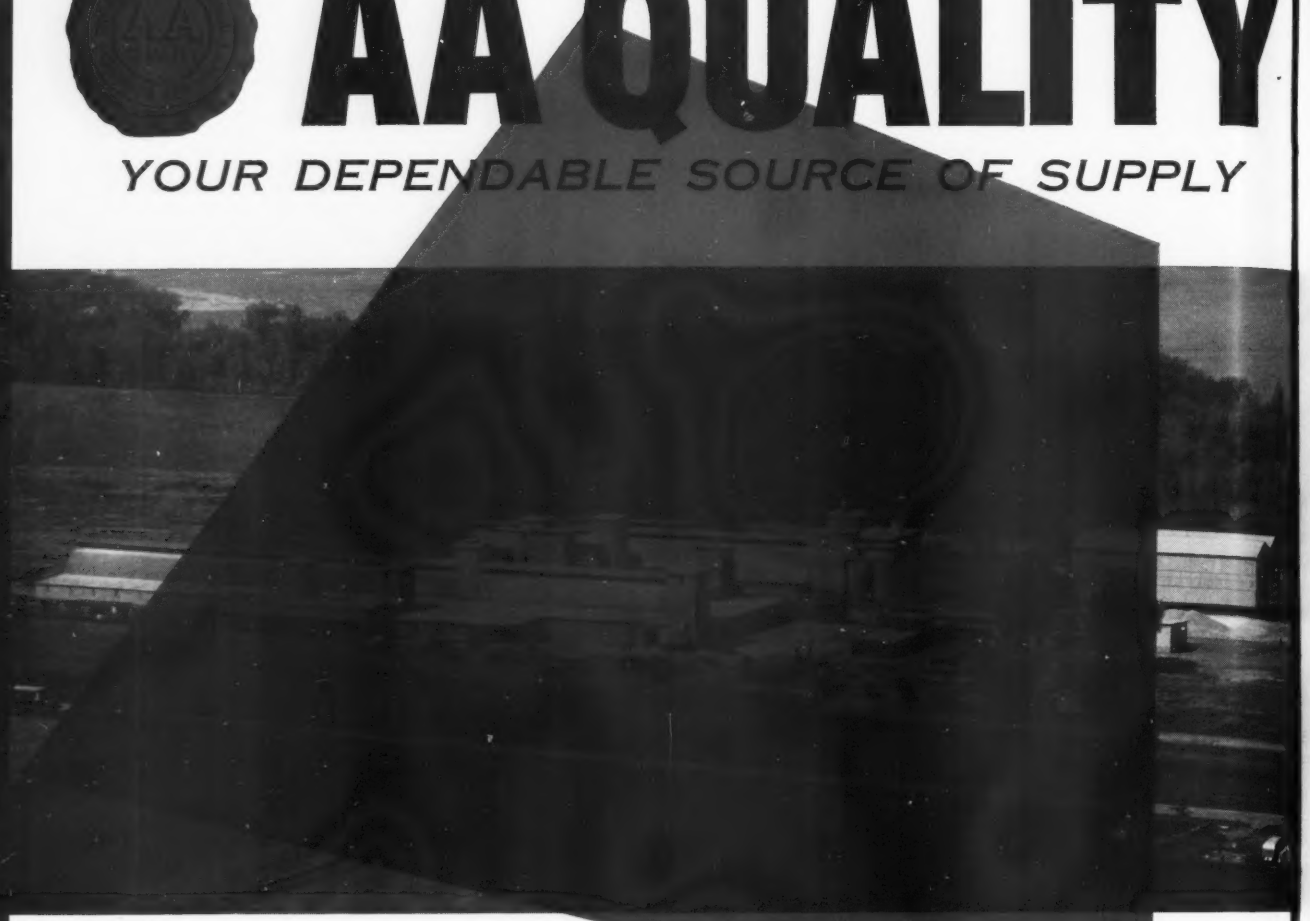

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VIEWING WASHINGTON

with Farm Chemicals Washington Bureau

on agriculture

The government's 3-year flexible price support policy now has been shelved —for this presidential election year at least. While Secretary Benson is still wedded to this theory—which has seen supports reduced during the past three successive years—the realities of continuing farm income declines plus political pressures have forced a temporary halt. Actually, even if Benson returns for another four years (provided Ike wins this fall), he will have a very difficult time reducing supports in at least the next two years.

Initial break in the down-trend of price supports came when the White House ordered the Secretary to continue wheat supports at this year's $2.00 per bushel rate for the 1957 crop. This amounted to enunciation of a new public policy for price supports across the board in 1956. It is highly improbable that supports for other crops would be reduced for 1957 in the face of the wheat hold-the-line policy. This new policy portends a new bullish factor on the farm income front—and probable benefits in sales for the farm chemicals industry.

The off-season fertilizer market may take a decided turn for the better this fall—because of a new export policy on wheat just announced by the Agriculture Department. Beginning September 4, USDA will step completely out of the wheat export sales business. Heretofore, the bulk of export sales made from this country came out of government surplus holdings. The private grain trade was largely short-circuited.

It means this: All exporters will have to buy their wheat from the open market (any subsidy required to make US wheat world competitive will be paid by UDSA in wheat, not cash as in the past). This is expected to bring farm wheat price increases ranging up to 15–25 cents higher per-bushel than in the recent past. Farmers have a much better income prospect for wheat and could be expected to look with favor to putting on more fertilizer for fall-sown wheat. With quotas in effect, little acreage expansion is likely—but farmers will try to increase per-acre yields.

The Acreage Reserve part of the new Soil Bank program for 1956 is expected to have about 8 million acres of cash-crop land after the final tally is in. Early reports indicated broader farmer interest than at first expected. At press time, both wheat and corn acreages were heading toward 3 million acres each in the Reserve, which pays farmers to underplant or underharvest crops for which acre allotments had been set.

At least one important change is being made in the Acreage Reserve program of interest to the fertilizer industry. USDA will offer farmers premium pay for keeping specified acreage in the Reserve for more than one year. Under the 1-year policy formerly in effect, farmers could boost fertility of cropland one year while in the Acreage Reserve (receiving payments), and use that built-up land for production the following year. With the interest shown in this angle, USDA officials worry that possible increased production on these acres might help nullify the total Soil Bank—designed to reduce surplus production.

Cotton farmers face a shortage of bale ties this year because of the steel strike, plus a walk-out of railroad employees at the Birmingham plant of Tennessee Coal and Iron division of U. S. Steel. Only TCI and Atlantic Steel Co. of Atlanta produce bale ties domestically.

VIEWING WASHINGTON

on business

Continuing evidence of penicillin in the Nation's milk supply definitely will bring on government action. FDA officials are concerned that even the relatively small amount of antibiotic now getting into consumer milk constitutes a public health hazard. They believe none should be contained. There have been cases where highly-sensitive people showed sharp shock reactions to small amounts of penicillin.

A 1956 survey of the nation's milk supply—in all 48 states—reveals that at the present time about 6 per cent of the consumer supply is contaminated by penicillin.

Careless use of mastitis ointments containing penicillin—considered most effective antibiotic for this purpose—is believed to be the cause of contamination. One of FDA's top antibiotic authorities, Dr. Henry Welch, says flatly: "There is little doubt in our minds that the great bulk of milk on the American market containing antibiotic residues results from the complete disregard of (label) warning." Labels are supposed to instruct farmers to discard, or feed to animals, the milk from treated cows for at least 3 days after treatment.

At the time FDA first recommended discarding milk from treated cows, it had no definite proof as to just how long antibiotics remain in the udder after application. But officials say "we now believe that though small amounts of antibiotics may remain in the milk after the 3-day interval recommended, 90 to 100 per cent is eliminated in most instances during the first 24 to 48 hours."

Proposals under consideration include: 1. A ban on penicillin in mastitis ointments. Officials say broad-spectrum antibiotics could be substituted with the same benefits, minus the disadvantage. 2. Order use of a dye in mastitis preparations to discolor milk from treated cows until penicillin is clear. 3. Order more conspicuous warnings on package labels and syringes. 4. Launch a government-industry educational program.

Look for the muscle of the US government to be put fully behind the new policy of investigating and developing new industrial uses for agricultural commodities.

In addition to creation of a special commission to study the potential and report to Congress next year—Congress is getting behind bills to set up an Industrial Agricultural Products Agency within USDA. Research would be conducted at Beltsville and at regional research centers. Congress was considering legislation to capitalize the organization initially at $100 million. Even though this proposal may get lost in the final rush of congressional adjournment, there is no doubt in ag. circles that such an agency will eventually be set up.

In the meantime, The House Agriculture committee has nominated five members for the Commission on Increased Industrial Use of Agricultural Products —as called for in the 1956 Farm Act. While not finally approved at press time, they include: G. H. Coppers, N. J.; C. R. Sayre, Miss.; F. J. Welch, Ky.; K. D. Butler, N. Y.; and J. L. Welsh, Neb.

FDA research facilities are to get a shot in the arm. General Services Administration has asked funds for a new and separate building to house the agency in Washington. Congressmen also say that the pressure of the use of more chemicals in or on food makes it "completely necessary" that FDA research facilities be broadened.

Chemicals

249—Polyfon Dispersant

Applications of Polyfon sodium lignosulfonate as a low priced, moderately active dispersant in wettable insecticide powders are described in a technical bulletin from West Virginia Pulp & Paper. Made in five grades varying in degree of sulfonation, three of the polyfons are already widely used in wettable powder formulations. The grade selected is dependent on the carrier, toxicant and equipment and process used in preparing the powders. Full information is provided in the bulletin

CIRCLE 249 ON SERVICE CARD

250—Penite 6X

This highly concentrated sodium arsenite solution from Pennsalt has a variety of uses—potato top killing, aquatic and general weed control, termite control and tree-stump killing and debarking. The odorless material contains the equivalent of 9.5 lbs./gal. of arsenic trioxide. For bulletins covering the applications described here

CIRCLE 250 ON SERVICE CARD

251—Vapam Sterilant

The uses of Vapam soil sterilant are described in a new Stauffer Chemical leaflet. It outlines the type of pests controlled by the new chemical and the various methods of application—hand, sprinkler, injection, plow sole and irrigation. For a copy

CIRCLE 251 ON SERVICE CARD

252—Sulfoxide Synergist

This product of S. B. Penick may be the answer to one of your formulation problems. It is an effective synergist—safe to use, non-irritating and has a mild, pleasant odor. In a dramatic publicity campaign, one firm offers $25,000 for the bug that is not killed by a formulation of sulfoxide, dieldrin and BR-135. For technical information and suggested starting formulas for popular sprays, formulators can

CIRCLE 252 ON SERVICE CARD

253—Killing Lawn Pests

The easy way to kill lawn pests is with chlordane granules, says Velsicol Corp. The material is easy to use, controls a wide variety of insects, is safe to handle and it can be mixed and spread with fertilizer. A small descriptive folder is designed to show your customers that chlordane is the material to use. For a sample copy

CIRCLE 253 ON SERVICE CARD

FREE INFORMATION to help you solve fertilizer, pesticide problems

Reader Service

254—Ag Ferric Sulfate

A small booklet from Stauffer Chemical describes, with "how-to-use" instructions, the use of ferric sulfate in treating soil to correct pH and to improve soil structure. Other benefits include improved water penetration, a supply of needed iron, increasing germination and growth on alkaline soils and speedier recovery of alkaline regions. For a copy

CIRCLE 254 ON SERVICE CARD

How to use the

READER SERVICE CARD

- **Circle number of literature you want.**
- **Print or type your name, position, company and address.**
- **Clip and mail the Service Card.**

Process Equipt.

255—Sturtevant Equipment

Dry processing equipment is reviewed in a new booklet from Sturtevant Mill. Emphasizing the "open-door" feature of all the firm's equipment for easy and fast cleaning, inspection and maintenance, it discusses Sturtevant's cooperative engineering plan. Also provided are specifications and photos of crushers, grinders, pulverizers, elevators, conveyors, dens, excavators, feeders and other units in the Sturtevant line. For a copy

CIRCLE 255 ON SERVICE CARD

256—Continuous Acidulation

Small and medium size superphosphate operations can include continuous acidulation set-ups, says Davidson-Kennedy, incorporating a TVA cone mixer and a continuous den. Initial cost and operating costs are said to be low and two men can operate a plant at a continuous rate of 20 tons/hour. For complete information

CIRCLE 256 ON SERVICE CARD

257—B&L Coactor

Newest liquid fertilizer plant is a Barnard & Leas neutral solution unit featuring the B&L Coactor. In addition to production of aqueous ammonia, the plant will turn out a wide range of ammonium phosphate solutions and complete fertilizers. Controls are pre-set for the desired formula and can be easily changed for producing various solutions. For complete details

CIRCLE 257 ON SERVICE CARD

258—Granulating Costs

D. M. Weatherly has announced a "deep cost cut" in the formulation of granular fertilizers. Successful operating tests with a new technique have been completed and the firm is now prepared to offer it in conjunction with its controlled-granulation method. For full information

CIRCLE 258 ON SERVICE CARD

259—Hammer Grinder

Five models of the Kelly Duplex Industrial Hammer Grinder are available with throat openings from 12 to 24 inches and a motor range from 30 to 150 hp. The duplex Mill & Mfg. units are equipped with screens that can be changed in less than 30 seconds without removing the mill cover. All grinding is done in mid-air as swinging hammers repeatedly strike the material while it is in suspension. For complete information

CIRCLE 259 ON SERVICE CARD

260—Coating & Granulating

Costs of coating granular fertilizers can be reduced, according to Omega Machine Co., with the firm's proportioning system. Coating material is fed from a non-flooding gravimetric belt feeder to the product stream being weighed by Builders Conveyoflo and proportioned in accurately controlled ratio. This could increase your competitive advantage! Bulletins are available.

CIRCLE 260 ON SERVICE CARD

261—Patterson-Kelley

Dry blending and heat transfer equipment is described in an enlarged catalog from Patterson-Kelley. The 16 page book covers all models of twin-shell, double-cone and ribbon blenders in addition to other chemical process units. Included for the first time is data on a new liquid-feed twin-shell blender for adding liquids to dry materials.

CIRCLE 261 ON SERVICE CARD

262—Rietz Disintegrators

A new bulletin from Rietz Mfg. for the chemical process industry deals with applicators of various Disintegrator models to fine or coarse disintegration and/or mixing of wet and dry materials. For a copy

CIRCLE 262 ON SERVICE CARD

263—Dust Problems

Torit Mfg. describes the principles of unitized dust collection, its advantages and savings in a new booklet. Illustrated with cartoons, cutaways and product photos, it describes dust damage, general product information, uses and reductions in operational expense.

CIRCLE 263 ON SERVICE CARD

264—American Homomix

A data sheet from American Well Works describes application of the Homomix as a continuous pipeline mixer and as a batch unit providing features and design data with curves on size and capacity. For a copy

CIRCLE 264 ON SERVICE CARD

Materials Handling

265—Joy Limberoller

Joy Mfg.'s Limberoller belt conveyor idler is based on the principle of single-roll, load-conforming catenary action. Advantages include a cushioned ride, minimum spillage and wear, ease of maintenance, long life and savings on both purchase and installation. The units are available for belt widths from 18 to 72 inches. A booklet provides design and application data, specifications tables and drawings.

CIRCLE 265 ON SERVICE CARD

Packaging

266—Bagpaker Model AF

International Paper Co. has incorporated improved design in a new model AF rotary-type Bagpaker capable of packing from 20 to 25 multiwalls per minute with one operator. The new design handles free-or semi-free-flowing materials and features simplified operation and maintenance. Automatic sewing reduces bag size and cuts cost. For detailed information

CIRCLE 266 ON SERVICE CARD

How to use the

READER SERVICE CARD

- **Circle number of literature you want.**
- **Print or type your name, position, company and address.**
- **Clip and mail the Service Card.**

267—Exact Weight Scale

Exact Weight Scale's newest automatic net weigher is available in two models, one for products weighing up to three pounds and a second for capacities from three to 10 pounds. Two feed rates are each fully adjustable to provide bulk and dribble feeds. Features include an even balance 1 to 1 ratio scale with visual indicator, net weight hopper and automatic cutoff controls. For literature

CIRCLE 267 ON SERVICE CARD

268—Packaging Work Kit

Designed to aid you in determing your packaging requirements Union Bag & Paper offers a Fertilizer Packaging Work Kit which includes a new calculator for figuring Union's bagging cost-per-ton. Fertilizer manufacturers only can

CIRCLE 268 ON SERVICE CARD

269—St. Regis Bagger

The St. Regis 135 AS Model F automatic bagging scale speeds weighing, giving you top output during a short shipping season. Accurate weights with 5 oz. on 95 per cent of all bags packed are claimed and single-bucket design provides quick clean-out, fast weight adjustment and minimum down-time for grade changes. For more information

CIRCLE 269 ON SERVICE CARD

270—How to Load Boxes

Hinde & Dauche offer a new edition of "How to Stack & Load Corrugated Shipping Boxes," a 16-page booklet describing methods of estimating storage space, distributing load weights, handling, identification and the use of gates, bulkheads, barricades and weatherstripping.

CIRCLE 270 ON SERVICE CARD

Application

271—Flo-Mix Distributor

The Flo-Mix fertilization method applies NH_3, phosphoric acid and potash solution simultaneously, 2 to 8 inches below the soil surface. Ammonia is blanketed with potash or water as it enters the soil, preventing loss through vaporization. Applicators are available as pull type of tractor mounted rigs. If you are interested in a distributorship handling this equipment

CIRCLE 271 ON SERVICE CARD

272—RegO Globe & Angle Valves

Bastian-Blessing lists a variety of reasons why you should look into its Rego globe and angle valves—elimination of maintenance problems, a wide selection, simple operation, high capacity, long-life, small size, light weight, diversity of uses and assured quality. They are equipped with an exclusive V-ring pressure seal and the nylon seats are said to last a lifetime. For complete RegO literature

CIRCLE 272 ON SERVICE CARD

273—Transfer Hose

Aeroquip 1541 ammonia transfer hose features reusable steel socketless fittings and is specifically designed for the safe transfer of NH_3. The unit resists corrosion, will not blister and is available in five sizes—from ½ to 1½ inches. The one-piece fitting will not leak or blow off but can be inserted into the hose by hand—without special assembly tools. For a descriptive bulletin

CIRCLE 273 ON SERVICE CARD

Miscellaneous

274—Ammonia Leaks

To aid in detecting ammonia leaks, Nitrogen Division offers a pocket size booklet containing paper strips impregnated with phenolphthalein. Held near a suspected leak, the strip shows the presence of ammonia by turning red. Ammonia users and bulk operators can

CIRCLE 274 ON SERVICE CARD

See pages 57, 60, 62 for information on these Reader Service numbers—

275—Hopper Scale
276—Ladcote Coatings
277—Coil Heaters
278—Power Steering
279—Aerosol Top

GOVERNMENT

TVA Diammonium Phosphate Sales

From April, 1955, through March of this year, TVA reports it distributed 4,403 tons of diammonium phosphate for use in research, test-demonstration programs and in an educational sales program.

Distribution was made in 23 states to 27 different distributors. Of the 4,403 tons, 860 were used in test-demonstrations; 63 tons went to state colleges for experimental work; 14 for research and 3,466 tons were distributed in the educational sales program in which TVA, land-grant colleges, agencies of USDA and the wholesale distributors join.

DS Award Goes to Lyle T. Alexander

A Distinguished Service Award recently was presented Lyle T. Alexander of the Soil Conservation Service, Beltsville, Md., for his successful use of soil science and related sciences to advance human understanding of soil formation, behavior and use, and of the effects of radioactive materials on soils and plants.

ICA Authorizations

Indonesia. $12,000—agricultural pesticides (PIO/C No. 97-11-004-5-60277). Source: USA & poss. Terminal delivery date: March 1, 1957. Procurement through Emerg. Proc. Serv., GSA.

India. $2,300,000 (approx.)—nitrogenous fertilizer (Foreign Currency Auth. No. 86-230-45-544-X6002). Contract period: June 11 to Oct. 31. Source: Italy. Terminal delivery date: Nov. 30.

$1,641,000 (approx.)—nitrogenous fertilizer (For. Currency Auth. No. 86-230-09-545-X6003). Contract period: June 11 to Oct. 31. Source: Germany (Fed. Rep.) Terminal delivery date: Oct. 31. Procurement through GSA.

Taiwan (Formosa). $36,520—agricultural pesticides (PIO/C No. 84-19-023-6-60296). Contract period: June 14 to Sept. 30. Source: World wide. Terminal delivery date: Dec. 31. Proc. through Central Trust of China.

Extend Soil Bank Crop Disposal Date

Earliest deadline date for disposition of crops to qualify acreage under the 1956 Acreage Reserve part of the Soil Bank program was set 15 days later to July 15, USDA reported last month. The change affected only compliance with the 1956 Acreage Reserve program, USDA emphasized, and did not extend disposition dates for compliance with allotments under price-support and marketing quota programs.

Gypsy Moth Area Extended in N. E.

Additions were made to the gypsy moth regulated area in Connecticut, Maine, New York and Vermont in a recent revision of quarantine regulations. The new orders also combine into a single, continuous regulated area the additions plus the former gypsy moth generally-infested and suppressive areas in the New England states and New York. The brown-tail moth regulated area also is extended into New England.

Authorization has been given the chief of USDA's Plant Pest Control Branch to issue administrative instructions listing counties and other civil divisions in which infestations of the gypsy- or brown-tail moth occur or which should be regulated for other reasons.

Senate Group Acts On Phosphate Bill

The Senate Interior and Insular Affairs Committee has reported to the Senate floor for passage a bill to lift the limit on public phosphate lands which a company or individual can have under lease in a single state.

Further action has been held up on a similar bill, H. R. 8394, by a subcommittee of the House interior committee, pending additional information from companies which would be affected by the legislation.

Under existing legislation, a firm or individual can hold 10,240 acres of phosphate-bearing public lands under lease, but only 5,120 acres within any one state. The two bills under consideration would repeal the limit within a single state.

'57 Wheat Support to Continue at '56 Level

Price support and the Acreage Reserve unit rate for wheat in 1957 will be continued at the levels in effect for this year's production, USDA has announced.

Wheat price supports average $2 a bushel, and the unit rate under the Acreage Reserve of the Soil Bank in 1957 will continue to be 60 per cent of the national average price support level, or $1.20 a bushel.

Actual payments which farmers can earn for taking part in the 1957 Acreage Reserve will be determined by multiplying the base unit rate for the local county by a yield figure which will be established for the farm by the county Agricultural Stabilization and Conservation committee.

1957 ACP Program

USDA has announced that the 1957 Agricultural Conservation Program will differ only slightly from the current program. In operation for 20 years, ACP in 1957 will have $250 million authorized by Congress.

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Opportunities in WORLD PESTICIDE SALES

Part II

By John Harms

EASTERN Hemisphere countries—Europe, Asia, Oceania and Africa—generally are ready and willing markets for United States-produced chemicals. But as in many countries of the Western Hemisphere, biggest potential lies, on the whole, in sales of the newer insecticides. The Commerce Department's "World Survey of Pest Control Products," points out that demand depends upon such things as government policies, dollar availability, manufacturing versatility within individual countries, competition from other highly industrialized areas and acquaintance with the benefits of various insecticides.

The United Kingdom has always been a competitor of the U. S. in world pesticide markets. But in recent years, even keener competition has arisen from Central European countries, particularly West Germany. Since World War II, numerous countries in this area have gone into production of the newer pesticides, such as DDT, BHC, lindane and phosphatic insecticides.

Europe

Reports indicate that credit terms offered European exporters are more lenient than those offered U. S. firms—and often quoted prices are lower. Increasing competition from this area is forecast. But despite greater production, Europe still remains a sizeable market for U. S. pesticides. Exports to that continent, the study says, were 56 per cent higher in value in 1954 than in 1953—but in 1955 were only 19 per cent higher than those of 1954.

Austria. Under present conditions, prospects for increased U. S. participation in this pesticide market do not appear promising. While it's possible that manufacturers might want to produce pesticides under licensing arrangements with U. S. firms, the undoubted tendency is to develop such contacts with West German and Swiss firms.

Belgium. Information on the pesticide industry is scarce, but the recent growth in the use of pesticide products and increased imports from Germany indicate sales of U. S. specialized commodities might be expanded—if competitive conditions are met.

Denmark. The new product field offers the greatest opportunity in this market. Most large Danish firms are affiliated with European producers and those products dominate the market. Imports from the U. S. may be upped if the dollar position improves.

Eire. Except for new products not available elsewhere, prospects for increased U. S. participation in the Irish market are not encouraging. To improve their market position, U. S. pesticides must be able to compete with the lower priced British products—which have the additional benefit of a preferential customs duty and lower freight charges.

Finland. The greatest market for U. S. products, again, is in the field of new pesticides.

France. Trade sources indicate U. S. pesticides enjoy an excellent reputation in France, and although domestic production largely meets demand, there's interest in procuring U. S. materials, especially the newer or specialized products. Prices for U. S. pesticides are competitive and sometimes lower than domestic products—despite the 25 per cent import tariff. Dollar exchange is by all odds the greatest roadblock to greater U. S. imports. It is probable that future U. S. pesticide participation in this market will increase through licensing arrangements or establishment of U. S. branch plants there.

West Germany. Opportunities for use of U. S. technical know-how lie principally in the licensing of German firms to manufacture U. S. pesticides. The report goes on to say: "The high standard and volume of German production, customary preference for German-made products, well-established domestic trade channels and freight and other costs involved preclude increased sales of U. S. pesticides to West Germany. It is unlikely that these factors can be overcome and that U. S. exporters can improve their competitive position in Germany.

Italy. The Italian government limits dollar imports to essential items not produced domestically or obtainable from the countries in the European Payments Union. Thus, any improvement in the competitive position of U. S. pesticides depends upon this country's ability to liberalize trade with the dollar area.

Netherlands. Consumption is expected to increase. Increased sales of U. S. products depend on

Total United States Exports of Pesticides, by Areas and Principal Countries of Destination, 1945 and 1953-55

(Quantity in thousands of pounds; value in thousands of dollars)

Area and principal countries of destination	1945		1953		1954		1955 (preliminary)	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
North America:								
Total[2]	66,308	4,792	150,720	22,670	141,700	25,108	188,807	34,464
South America:								
Total[2]	20,290	2,520	46,325	9,960	65,430	14,372	54,099	15,805
Caribbean Area:								
Total[2]	5,152	702	7,640	1,743	9,730	2,108	11,011	2,556
Europe:								
Austria	.....	.....	31	11	59	41	5	5
Belgium and Luxembourg	4	2	470	185	395	250	703	521
Denmark	.....	.....	121	47	201	91	297	236
Finland	.....	.....	47	25	50	30	67	48
France	4,695	244	912	302	885	468	2,161	1,181
Germany, East	.....	.....	.....	.....	113	39	.....	.....
Germany, West	.....	.....	250	170	663	275	490	329
Greece	316	66	171	55	2,453	455	1,065	216
Italy	1,171	115	1,360	650	1,385	770	1,027	579
Netherlands	29	21	795	250	1,397	505	1,708	600
Norway	22	21	206	91	264	150	247	129
Portugal	69	24	101	45	80	39	72	46
Spain	155	21	12	4	241	93	845	606
Sweden	181	45	192	78	563	259	729	324
Switzerland	54	6	309	253	390	298	276	216
Turkey	898	62	4,865	1,160	5,494	1,256	3,829	957
United Kingdom	310	107	250	135	807	412	815	450
Other[1]	[3]4,705	475	90	30	18	13	37	17
Total[2]	12,600	1,210	10,175	3,485	15,460	5,446	14,374	6,463
Africa:								
Angola	39	6	57	16	82	18	87	28
Algeria	217	43	445	62	1,238	131	143	45
Belgian Congo	107	18	6,220	645	5,232	621	9,669	1,173
British East Africa	107	21	38	14	148	96	200	70
Cameroons	50	7	93	53	588	179	400	130
Egypt	2,024	226	576	166	1,303	221	3,077	371
French Morocco	139	24	435	150	473	167	790	320
French West Africa	22	6	150	57	207	63	848	389
Liberia	10	3	500	71	502	74	517	82
Madagascar	8	2	1	1	69	32	4	2
Mozambique	166	26	181	71	1,464	125	257	130
Nigeria	49	6	238	25	9	7	28	15
Rhodesia and Nyasaland	105	25	1,091	90	490	100	1,468	236
Tunisia	14	3	116	9	42	19	56	25
Union of South Africa	3,517	584	1,924	716	2,824	943	3,931	1,343
Other[1]	189	57	200	35	104	31	[6]382	100
Total[2]	6,766	1,060	12,260	2,185	14,775	2,830	21,855	4,465
Asia and Oceania:								
Afghanistan	5	1	229	85	84	26	133	44
Australia	1,000	620	342	176	670	435	300	322
British Malaya	32	3	30	25	85	56	208	117
Burma	.....	.....	540	210	667	208	706	237
Ceylon	60	42	340	157	490	325	83	25
French Pacific Islands	29	1	72	40	71	49	87	47
Hong Kong	.....	.....	35	15	18	16	25	23
India	6,148	7,059	7,076	2,580	11,827	4,167	11,779	4,498
Indochina	.....	.....	505	125	150	73	356	148
Indonesia	949	92	3,470	740	3,895	1,146	4,990	1,813
Iran	79	36	1,061	437	2,692	946	1,757	708
Iraq	81	11	235	85	356	150	1,328	517
Israel and Palestine	648	48	746	190	448	277	332	304
Japan	.....	.....	2,035	1,592	1,305	991	1,424	1,412
Korea	.....	.....	2,355	265	3,330	790	2,618	1,027
Lebanon	.....	.....	407	67	768	165	744	123
Nansei Islands	.....	.....	.....	.....	75	42	126	26
New Zealand	312	83	85	30	87	55	591	304
Pakistan	[4]	41	1,281	463	2,175	1,340	891	745
Philippine Republic	253	43	3,326	978	2,140	610	2,983	924

United States Pesticide Exports (Continued)

Area and principal countries of destination	1945		1953		1954		1955 (preliminary)	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Saudi Arabia	68	19	336	150	334	91	469	217
Syria	154	19	406	85	411	100	258	51
Taiwan			490	165	581	211	179	132
Thailand			865	280	926	290	875	280
Other[1]	[5]906	144	85	15	170	16	229	31
Total[2]	10,726	8,225	26,340	8,955	33,760	12,570	33,469	14,075
Estimated shipments valued at $100 to $499, as reported by the Bureau of the Census			191	46	995	306	4,527	1,311
Grand total	121,853	$18,505	253,697	$49,060	281,860	$62,740	328,131	$79,133

[1] Includes those countries to which less than $10,000 worth were shipped in each of these periods. [2] Because the figures are rounded, the sum of the columns, in many cases, will not exactly add to the totals. [3] Includes 227,000 pounds of copper sulfate to USSR; 2,600,000 pounds of copper sulfate to Yugoslavia; 325,000 pounds of household and industrial insecticides to Yugoslavia; and 1,236,000 pounds household and industrial insecticides to Poland and Danzig. [4] Included with India. [5] Includes the following shipments to China (in pounds): 101,000 of lead arsenate, 100,000 calcium arsenate, 121,316 miscellaneous agricultural insecticides and related materials, and 544,155 of household and industrial insecticides. [6] Includes 251,000 pounds ($54,000) to Anglo-Egyptian Sudan.

Source: Bureau of the Census, U. S. Department of Commerce.

See page 47 of the July issue for figures on specific Western Hemisphere countries

appointment of local representatives who will actively promote such sales, broadening credit terms, and speedier delivery.

Norway. Outlook is not too good for U. S. products; competition with other European countries is stiff and the market is small.

Portugal. Little increase in pesticide use is expected—farmers have very low incomes; use antiquated farming methods.

Spain. Dollar shortage is big limiting factor. But there are opportunities for participation of U. S. technique in the pesticide industry in collaboration with Spanish firms.

Sweden. With the "free listing" for imports of U. S. pesticides into this country, dollar liberalization and the popularity of U. S. products, imports of pesticides from the U. S. are expected to increase.

Switzerland. Because of the well-developed pesticide industry, farm production restricted to its present size, general acquaintance with the value of pesticides—no increase in imports is expected, except by the introduction of new and specialized commodities.

Turkey. Potential markets for pesticides in Turkey are "enormous." But lack of education as to benefits, as well as low farm income and lack of dollar exchange, handicap imports of U. S. pesticides.

United Kingdom. Pesticide industry is well developed and progressive. While there may be a market for specialized pesticides, probably greater possibilities exist in licensing arrangements with British manufacturers for production in that country.

Asia and Oceania

Except for production in Australia and Japan, and a few plants in other areas, pesticides are not manufactured in this vast area. Asia and Oceania remains the third largest export market for U. S. pesticides—with India and the Philippines the major market.

Australia. Because of exchange restrictions, the U. S. share of the Australian market probably will not increase. Generally, however, the best opportunity for U. S. manufacturers lies in production in that country—either through licensing or by establishing a subsidiary.

Ceylon. Demand for agricultural insecticides is growing for various reasons. A considerable need for rodenticides exists. There's also a market for "a good grasskiller costing less than $10.50 an acre."

Formosa. Limited size of the market restricts opportunities for U. S. capital investments.

India. Official statistics on Indian imports of pesticides are unavailable, "but there is a large market for U. S. pesticides."

Indonesia. U. S. share of the pesticide market is expected to increase in the next few years, principally because of International Cooperation Administration procurement for public health use. For instance, proposed imports from the U. S. for this purpose in 1956 are 2,800 metric tons of DDT and 100 tons of dieldrin. Recommendations for further improving the competitive position of U. S. products are: Appointment of capable local representatives; increased promotional work, including field demonstrations; more U. S. company participation in, and

For More Details . . .

The Report, "World Survey of Pest Control Products," by Laura G. Arrington, U. S. Department of Commerce, can be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price: 60 cents per copy.

If you would like more details than appear in the published report on any country or countries, you can get them by writing the Chemical and Rubber Division, Business and Defense Services Administration, Commerce Department, Washington 25, D. C.

The basic reports are not being published, but can be borrowed. Upon receipt of your specific request, the C & R Division will ship the reports to your nearest Commerce Department field office and notify you. There they can be studied or borrowed.

identification with, procurement under assistance programs.

Iran. While U. S. products have a good reputation, possibilities for increased sales will depend upon further demonstrations on effectiveness of materials; better education of farmers on advantages of pesticides; alertness of U. S. manufacturer's Iran-representative; and better credit terms. Also, U. S. manufacturers should package their products more substantially for shipment.

Iraq. Looks like a good market, but expansion will be slow.

Israel. This market is limited by both population and geographic factors. U. S. capital has played a large part in the establishment of the two plants which were to begin production in 1955, but further investment at this time does not seem advisable unless exclusively for export. U. S. pesticides compare favorably with those of other suppliers both in quality and price. Imports are expected to fall off as domestic industry picks up steam. New products, effective advertising and extension of credits to importers and distributors may permit U. S. manufacturers to hold on to, or even increase, sales.

Japan. Low-cost pesticides are most popular. Cultivation of the Japanese market depends upon introduction of new products more effective than those now in use. This country is driving to become self-sufficient in supply of pesticides.

Lebanon. A limited market, but some potential exists.

New Zealand. A good market for concentrated materials. This country is dependent on imports of toxic ingredients for preparation of finished pesticides.

Pakistan. U. S. technical knowledge could be used to good advantage by Pakistan pesticide manufacturers. Government is giving priority to import of capital goods and raw materials required for the expansion of industry. But import restrictions and lack of dollar exchange don't augur well for increased pesticide markets.

Philippine Republic. Practically no pest-control products are made in this Republic. There appears to be opportunity for U. S. investment in the local manufacture of these products. The present Administration is trying to develop rural areas. A large supply of various kinds of pesticidal commodities is needed.

Africa

Belgian Congo and Kenya are the two principal world suppliers of pyrethrum. The Union of South Africa produces DDT and BHC, and copper sulfate is manufactured in Algeria and Egypt. Elsewhere in Africa there is little manufacturing or formulating of pesticides. Africa is a steadily growing market for U. S. pesticides. Value of exports to this continent in 1954 were about 30 per cent above those in 1953—and in 1955 were 58 per cent higher than in 1954.

Algeria. Prospects for increased participation in this market depend upon dollar availability.

Angola. The limited market would not appear to justify U. S. investment or technical knowledge in manufacturing pest-control products in this country. German farmers would be interested in demonstration materials and technical background. Weed-killers, in particular, should be readily acceptable, as labor is short—especially in the coffee plantations.

Belgian Congo. Little information is available.

Egypt. Consumption of pesticides is on the rise. Not much trouble with dollar exchange. U. S. pesticides have good reputation, but lower freight rates and faster delivery time favor European sources. Best bet for U. S. manufacturers apparently is to make on-the-spot experiments in conjunction with government officials.

Ethiopia. U. S. pesticides are popular, and a slowly increasing market shows promise.

French Morocco. Outlook for increased U. S. sales depends upon meeting French competition.

Liberia. U. S. commands the bulk of the market—future prospects depend upon increased consumption.

Mozambique. At present, no opportunity for capital investment or technical know-how in production. While many importers prefer the American product, they are reluctant to purchase on letter of credit.

Union of South Africa. Relaxation of import restrictions should permit increased U. S. participation in this market, particularly for products not now manufactured in the Union. ▲

WHAT'S NEW IN NEMATOCIDES

A Round-up of Recent Findings in Nematocide Developments Giving Latest Information On New Methods of Control

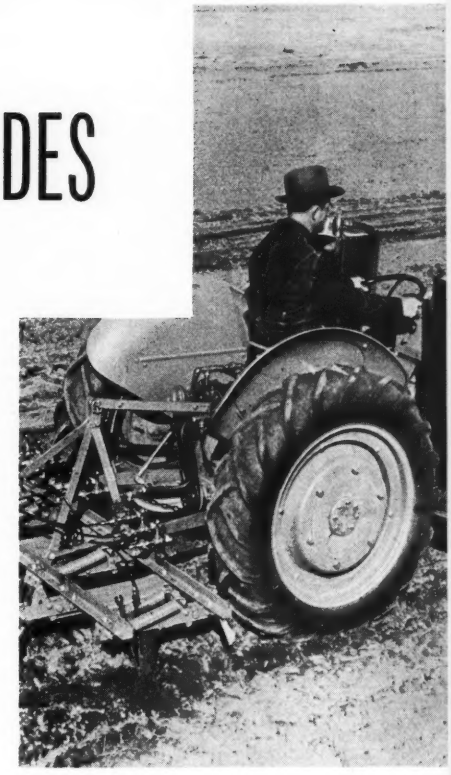

Photo by Shell Chem. Corp.

NEMATODES have received an increasing amount of attention from agencies conducting research on the improvement of plant growth. Three methods of control have been employed in attempts to lessen the plant damaging action of nematodes: Cultural practices, breeding of nematode resistant plant varieties and chemical control.

Cultural practices, such as crop rotation, crop-residue disposal, drying-out of soil to plow depth, flooding or heavy fertilizer applications, help to prevent build-up of nematodes in the soil.

The breeding of nematode-resistant varieties of many susceptible plants, and the use of nematode-resistant root-stock have been of considerable value.

Chemical control, the use of nematocides, has increased plant yields from infested soils sufficiently to make this control method economically feasible. This latter method has received the major share of developmental effort, and it is this method with which we are most concerned.

Before entering into a discussion of nematocides, it would be well to give a brief description of nematode types and the damage they cause.

Nematodes, both the plant parasitic and beneficial types, are microscopic, round worms belonging to the class *Nematoda*. They have complete digestive, reproductive and nervous systems. Nematodes are among the most abundant forms of animal life and numerically constitute the second largest group.

Nematodes are not newcomers to the roster of plant pests. They were known in Europe during the middle of the 18th century, and studies of their economic importance were initiated 100 years later. Nematodes are endemic to the soils of all continents. Where man has not cultivated the soil, nematodes generally present no problem, for they have arrived at a balance with the plant and animal life of their environment. However, when man introduces soil cultivation and cropping into a previously undisturbed earth surface, he initiates changes in the environmental balance which often favors the rapid increase and spread of the plant parasitic nematodes.

Generally, it can be said that nematodes do not limit their attack to the underground parts of plants, but also attack stems, leaves, flowers and fruit. Some nematodes attack only a few species of plants, while others attack a wide variety of plant species. Both annual and perennial plants are susceptible to attack, the attack being limited to external feeding on the plant or it may be carried out by a partial or complete penetration of the living plant tissue.

Visual evidence of nematode damage can be seen in such abnormal formations as galled or knotted roots, stems, leaves, fruits and seeds. Other symptoms of nematode attack are plant wilting, discoloration of leaves, swollen and distorted shoots, leaf spots, crinkled leaves, bunching and dwarfing of the entire plant, and blinding of buds. The phenomena

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From a talk presented by M. A. Manzelli, Research Department, Virginia-Carolina Chemical Corp., at the 14th annual convention of the Association of Southern Feed and Fertilizer Control Officials, June 29, 1956.

known as dieback, sunburn, winter bronzing and winter kill may be caused by nematodes. Ultimate results of these injuries due to nematodes is reduced yield or abnormal growth.

History of Chemical Control

Chemical control of nematodes has been practiced for many years. In 1881, carbon disulfide was used in an attempt to control the sugar beet nematode. In 1911, this same chemical was evaluated against the root-knot nematode and found to be successful. Immediately following World War I, tear gas, or chloropicrin was used for the control of the root knot nematode and until 1941, chloropicrin was the major nematocide in use. Its success in the control of the root knot nematode on pineapple in Hawaii stimulated investigations for the improvement of application methods. The first use of methyl bromide as a nematocide was reported in 1940. In 1944, a mixture of one part of ten per cent methyl bromide with three parts of ethylene dichloride and one part of carbon tetrachloride was reported to have given good control of root knot.

During the period of World War II, two new nematocides were successfully introduced. In 1943, Carter reported that a crude mixture of dichloropropane and dichloropropene was a good nematocide. In addition, this product was considerably cheaper than previously employed nematocides. This latter fact prompted its widespread use in the pineapple fields and in the Californian vegetable farms. Christie, in 1945, reported that ethylene dibromide had given excellent control of nematodes in initial testing, and the low cost of this product led to large scale development in 1946.

New Chemicals Introduced

Since 1950, three new nematocides have been introduced commercially. One of these, nemagon, chemically known as 1,2-dibromo-3-chloropropane, is a soil fumigant with a relatively low vapor pressure, and a low toxicity to a number of living plants. Another, vapam, which is sodium *N*-methyldithiocarbamate dihydrate, is a volatile soil fumigant that can be applied to soils for preplant treatment, either by injection or as a water drench. Vapam is highly phytotoxic.

The third is known chemically as *O*-2,4-dichlorophenyl *O*, *O*-diethyl phosphorothioate. This nematocide, usually applied as a water drench, is relatively new on the market and is sold as V-C 13 nemacide. The grower today has a variety of chemicals and methods to use for nematode control, as contrasted to the situation that existed less than two decades ago, when only a few soil fumigants were available.

Present day nematocides, either proprietary or experimental, can be classified roughly under the following usage methods: 1) Soil fumigant; 2) Chamber Fumigant; 3) Dip (for bare-rooted plant stock); 4) Drench.

Soil Fumigants include the following chemicals: chloropicrin, D-D (dichloropropene-dichoropropane mixture), EDB (ethylene dibromide), vapam (sodium *N*-methyldithiocarbamate dihydrate), nemagon (1,2-dibromo-3-chloropropane), CBP (chlorobromopropene), and methyl bromide.

Such soil fumigants are generally considered to be quite phytotoxic, although nemagon has been reported as being non-phytotoxic to several plants. Soil fumigants are usually applied by injection to infested soils prior to planting and the surface of the soil is then sealed by packing, by the use of water, or by a cover of some type. However, both vapam and nemagon can be applied as water drenches if the application is followed by the placement of a water seal.

The **Chamber Fumigant** most commonly employed is methyl bromide. It has been particularly effective when used in decontaminating equipment for the treatment of soil infested with golden nematode, and also in the treatment of empty shipping containers which have held golden nematode infested potatoes.

Dips have been developed for the control of endoparasitic nematodes infesting nursery seedlings. Two compounds have shown some value in this type of treatment: aaventa and aabulba. Both are organic-mercury compounds, originally developed in the Netherlands.

Meadow nematodes infesting the roots of many ornamentals have been killed by an hour long exposure to a one per cent bath of aaventa. Aabulba has been used only as a bulb dip. Both of these compounds may be of value in the elimination of internal feeding nematodes from plants that have to be shipped under quarantine laws. However, only aaventa is presently available in this country for experimental use.

Soil Drench, V-C 13 nemacide, the only one of this type, is now available as a proprietary compound. This nematocide, which is formulated as an emulsifiable concentrate, is diluted with water and can be applied to turf, to the soil surrounding the roots of living plants and to soil as a preplant treatment. As a preplant application, the treated soil is either disked or roto-tilled in order to aid the dispersion of V-C 13 nemacide. This compound has also been mixed with a solid carrier, placed in rows, or broadcast, and then roto-tilled into the top six

inches of soil. Used in hydroponics, V-C 13 has concontrolled root-knot on tomatoes. Application to infested plants has also been made by the introduction of V-C 13 into irrigation water or overhead sprinkling systems.

Solid Carriers, such as vermiculite, attaclay and finely powdered silicon compounds, plus fertilizer itself, have been employed as carriers. These mixtures have been applied by means of holes punched in the infested soil, followed by raking, or by the use of modified fertilizer distributors which either broadcast or deliver in rows. The use of soil fumigants in a solid carrier eliminated the need for special types of applicators, but at the same time it presents severe packaging and handling problems.

Systemic Work Encouraging

Future outlook of nematocidal developments from reports indicate that some extremely interesting data are being accumulated. A recent publication by Tarjan and Cheo reports on the nematocidal value of a number of fatty acids, when employed as plant dips or as disinfectants of cyst-infested burlap. The two workers tested fatty acids containing unsaturated straight chains, with branched chains, with carboxyl groups and with a substituted aryl group. The maximum nematocidal activity was obtained when an intermediate number of carbon atoms was present in an alkyl straight chain arrangement. Heptanoic, octanoic. nonanoic, decanoic, and undecanoic acids were found to possess exceptional nematocidal activity. The high activity shown by cyclohexanepropionic and azelaic acids suggested that closely related compounds might be good possibilities for future investigations.

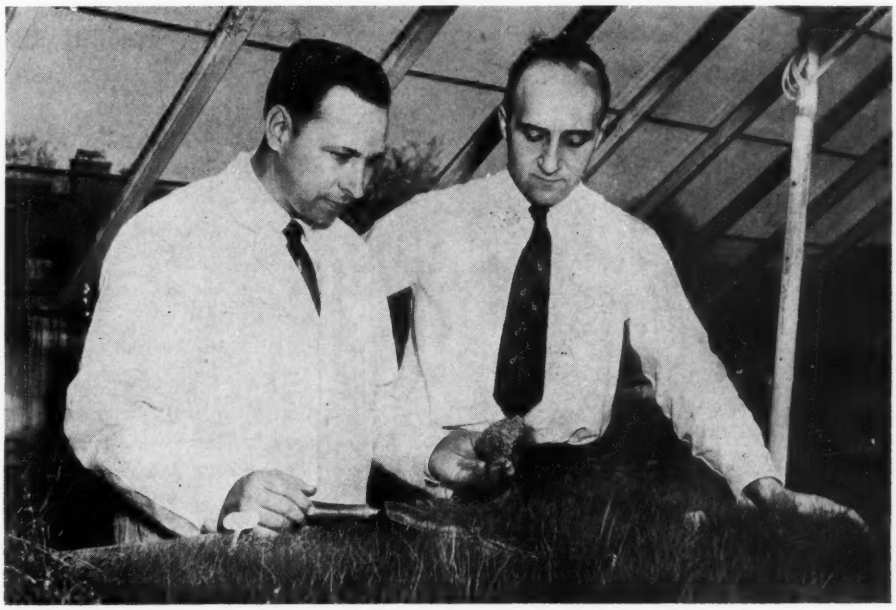
Progress reports are also being made on the search for a systemic nematocide. The investigations are directed to the discovery of a chemical that can be applied to the plant foliage, taken in the plant, and translocated downward into the roots and out into the surrounding soil. Many obstacles exist in the search for such a compound. Most of the available systemic pesticides move in an upward direction into the foliage. USDA researchers have initiated their investigation for a systemic nematocide with a study of the behavior of a plant growth regulator known as MOPA, (methoxyphenyl) acetic acid.

This compound moves foliage to roots and at times even out of the roots into the surrounding medium. Initial results show that this compound has repulsed root knot nematodes from tomato roots after the plants had been treated. There was, unfortunately, no other definite proof that MOPA had moved from the tomato foliage down to the roots.

In addition, MOPA proved toxic to the tomato plants, and thus is unsuitable for further evaluation. However, the chemical structure of MOPA provides a starting point for the synthesis of "downward-moving" systemic nematocides. Recently, several reports have indicated that the use of solid chemicals for the control of plant parasitic nematodes is receiving considerable attention. Urea is one of the first chemicals to be successfully employed in this manner. However, its usage has not, as yet, proceeded past the experimental stage.

Requirements of Nematocides

Inasmuch as we are still seeking an ideal nematocide, possibly the properties required of this compound would be of interest. They are as follows: nonphytotoxic, non-specific, volatile, residual, systemic, capable of being applied either as a water solution or as a solid, non-toxic to mammals and of low cost. ▲



Virgil Young and Dr. Arthur Manzelli inspect turf beds treated with V-C nematicide during research and development program.

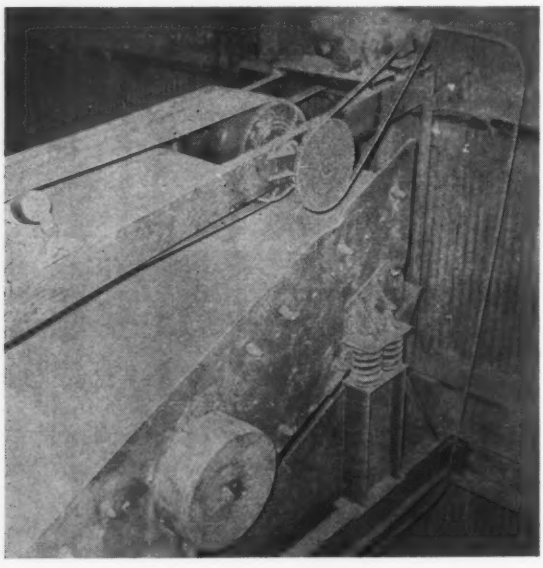
"Split-Stream" Granulation for Higher Production Rates

Double granulation unit used in conjunction with single sizing, crushing and ammoniating system at FARMCO plant.

IN LINE with the trend to higher analysis fertilizers and lowered production costs, the Wisconsin Farmco plant at Prairie Du Chien, Wisconsin, was recently modified for the production of granular fertilizer.

The installation is such that a single system for raw material screening, continuous feed, ammoniation and product sizing and crushing is used in conjunction with a double granulation unit. The double granulation unit, with two dryers mounted on top of two adjacent coolers, has a capacity of 25 tons per hour for 4–16 mesh granular sizes.

Main advantage of the double unit is that full production potential can be realized where limited headroom and mill tower space prevents the installation of a single unit of greater diameter and length.



The Prairie du Chien plant incorporates a Link Belt 2412 double deck screen, floor mounted.

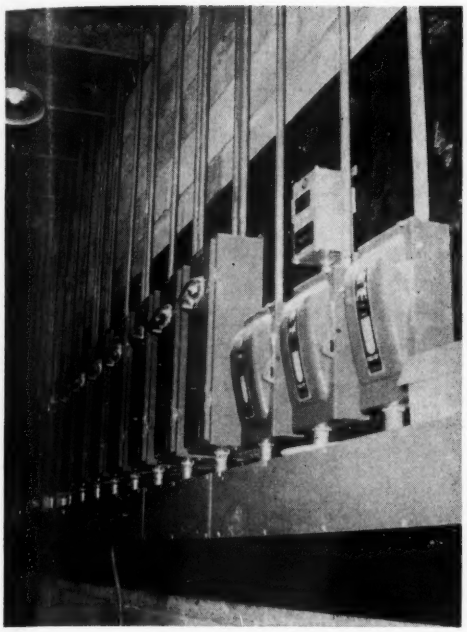
Raw material elevators and the gravimetric weigh feeder as well as crushing and sizing equipment are sufficiently large to handle the combined output of both granulation units.

The TVA type ammoniator also has a very flexible capacity range, although at higher feed rates the retention time is slightly decreased. However, with full length manifolds for even distribution and subsequent thorough mixing of all materials, any adverse effects of decreased retention time are minimized.

When running at higher rates, discharge temperatures tend to decrease, assuming equal amounts of sulfuric acid are used. At decreased temperatures, the ammonium nitrate salts are less soluble and therefore the mix may not be as plastic as desired for granulation. Desired plasticity is realized by addition of sulfuric acid to increase temperature, or by using additional water.

Discharge from the ammoniator is fed into a common hopper with an adjustable plate fixed so that the flow of ammoniated goods is split into two equal portions, each dropping directly into its respective drying unit. The discharged granular material from the twin coolers enters a common screw conveyor, from which it is transferred to the common sizing and crushing system.

With a single ammoniation system, proper formulation for both units is easily controlled to give uniformity of analysis. With "split stream" granulation the operator can proceed at optimum efficiency in any capacity range, but when granular production

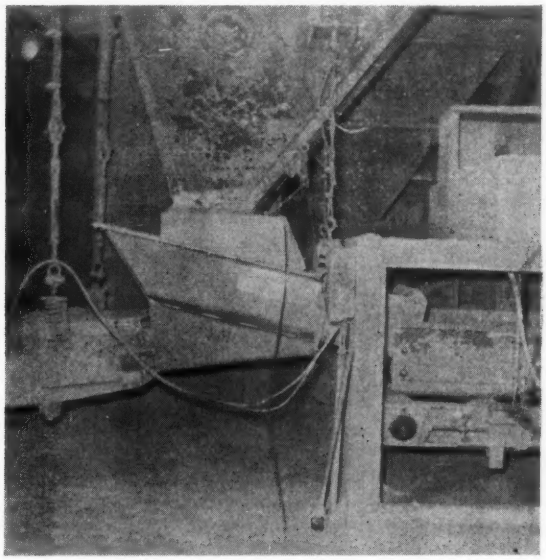


Combination switches in this room are used to control overall operations of the factory.

of only 10–12 tons per hour is needed, one unit can handle the entire production requirements, while maintenance and/or cleanup work can be done on the unit not in operation.

When running at lower production rates, both units can be used to give as low a moisture product as desired. The two dryers and coolers at high rates give a product that exhibits excellent mechanical qualities and, because of very low moisture content and low discharge temperatures, the product retains its free flowing characteristics throughout.

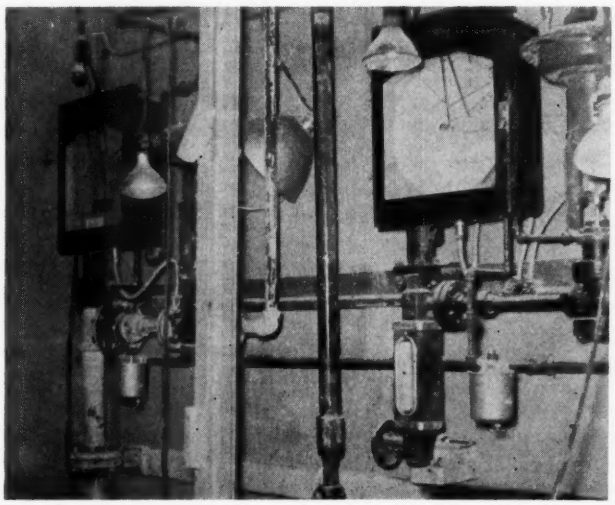
The double granulation unit as well as the required fans, cyclones, liquids metering, sizing, grinding and conveying equipment was supplied by the Fertilizer Engineering and Equipment Company, Inc., of Green Bay, Wisconsin. Three similar units, tailored to individual requirements, are already in operation at the Toronto and Chatham, Ont., plants of Canada Packers, Ltd. and in the new GLF Soil Building Service plant at Big Flats, N. Y. ▲



ABOVE. This Syntron unit weighs raw materials automatically, feeding to the production line.

BELOW. View of the double granulation facilities as seen from the operating platform end.

Fisher Porter meters, recorders, pneumatic controls and governor control valves for automatic operation.



Top Attendance at 7th Pacific Fert. Conference

LARGEST attendance in history was reported for the 7th annual Pacific Regional Fertilizer Conference at Yakima, Wash., June 28–30, as 257 persons registered for the meet. Sessions on the first two days were well attended and many people remained for the final day to view a machinery exhibit of equipment used in spreading dry and liquid fertilizers.

Portland, Ore., will be the site of the 1957 meeting scheduled for June 27–28.

Here are brief reports on some of the excellent papers delivered at the conference—those reporting experimental work with a direct bearing on your plant food business activities.

Irrigating orchard-grass-ladino clover pasture at a mid-summer frequency of seven to 11 days produced the greatest yields per acre of both clover and grass compared with 15 to 20 or 30 day intervals. The most frequently irrigated area also maintained the highest percentage of clover in the sod.

Seasonal application of 100 lbs. nitrogen as ammonium sulfate in 33.3 pound increments in April, June and August produced a greater yield than did 50 pound treatments in April and June. A total of 150 pounds of nitrogen in three monthly 50 pound applications, or a total of 200 pounds in four monthly treatments produced significantly less clover and did not produce a greater total yield than the 100 pound N treatment in three monthly increments.

C. E. NELSON, *USDA, Prosser, Wash.*

Legume crops growing on many eastern Washington soils suffer from nitrogen starvation, a condition that can be corrected on adequately nodulated plants of molybdenum applications. Moly fertilization has generally improved pea growth but has less frequently benefited alfalfa and sweet clover. Growth of these moly responsive crops can be improved by applications of either molybdenum or nitrogen fertilizers or lime.

H. M. REISENAUER, *State College of Washington*

Best grain yield for winter heat was obtained by applying dry fertilizer in early April. Maximum yield of 55.1 bushels/acre resulted from application of 90 pounds actual nitrogen per acre compared to 26.8 bushels from control plots. Only 2.8 bushels were produced from each acre-inch of water consumed when no fertilizer was used, but 5.0 bushels resulted from 90 pounds of nitrogen.

H. D. JACQUOT, *McGregor Land & Livestock Co.*

Studies have shown generally progressive increases in potato yield as rates of nitrogen and potash have been increased, but definite reduction in specific gravity of tubers at higher rates of N and K. Results of 1955 work show higher yields from plots treated with muriate of potash compared to sulfate form, but sulfate treated plots produced tubers of higher specific gravity. A comparison of two years' results show that regardless of fertilizer treatment, climatic variations have the greatest influence on specific gravity of potato tubers.

H. A. KITTAMS, *Western Washington Experiment Station.*

Data on protein content of wheat grain indicate that on many farms some nitrogen is needed to raise the protein to desirable levels. On an experimental site protein content, in general, did not rise to objectionable high levels until nitrogen application went beyond the rate producing the maximum demonstrable yield increase.

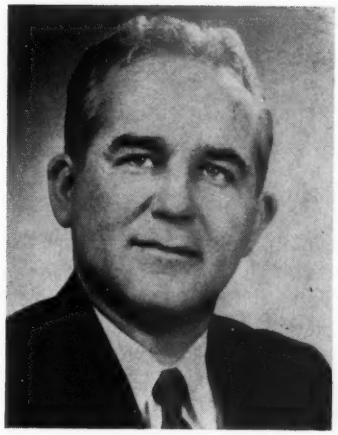
A. S. HUNTER, *Oregon State College.*

Results of tests on sweet corn, cucumbers and pole beans indicate that generally only small differences in yield can be anticipated between liquid and dry forms of fertilizer when applied in recommended placements. Advantage of either source over the other would be related to convenience of application, etc., rather than to superiority in terms of increased crop production.

W. P. MORTENSEN, *Western Washington Experiment Station.*

The Farm Problem

A penetrating discussion of its basic causes and the impact of the farmer's plight—both economic and social—covering capital investment, cost of production and the law of supply and demand. The author calls for political courage in seeking a reasonable approach to an effective farm program.



Dr. W. G. Becker, Assoc. Professor, Economics and Business Admin., Arizona State College

IN the current political discussion of the farm problem the basic economic position of agriculture is rarely discussed. In our preoccupation with trying to find politically acceptable programs for the election year, we lose sight of the fundamental conditions that have produced the present glut of foods and and fibers. As a result, most of the programs presented are mere stop-gap measures, and many of them will only aggravate the problem in the long run.

The Social Problem

The farm problem has a two-fold aspect: it is both a social problem and an economic problem. On the social side, we have one million low-income farmers, mostly in the Southeast. This group produces only eight per cent of the total farm product, although it accounts for some 20 per cent of the total number of farmers.

Obviously, these people should move off their farms for their own good; but they have shown a remarkable tenacity in clinging to the land. Either they fail to see better opportunities elsewhere, or they consider farming as a more desirable way of life.

The solution to this problem is strictly a long run affair. Additional educational opportunities may induce some of them to leave, but possibly only starvation levels of income would make any great dent in their numbers. But even if these one million farmers should cease production, the economic problem would still be with us. The remaining four-fifths of the farmers would still be producing over 90 per cent of what is now being produced.

The basic difficulty in agriculture is that both demand and supply are what the economist calls "in-elastic;" that is, they do not respond fully to change in price. Throughout the greatest part of capitalistic economy, the price mechanism is what equates supply with demand. When the supply is large, prices will fall until the increased demand at lower prices takes the surplus off the market.

The Economic Problem

When the supply is small, the price will rise until enough buyers will be driven out of the market so that the smaller demand will equate the supply. Any interference with this function of price will cause disallocations in the market. For example, under price control, shortages appear because the price is low enough to attract more buyers than there are sellers. If the price of Cadillacs were reduced to $2,000, there would be an immediate shortage: at $5,000 there is not.

In a free-enterprise economy, the price system also works in another powerful way. When selling prices are high in relation to costs, additional capital and

labor are attracted into the field, and the force of competition lowers prices to an approximation of cost plus a reasonable profit. Conversely, when prices fall too low for profitable operation, both capital and labor move out of the particular industry into another more profitable one. Our industrial history is replete with examples of this constant shifting of capital and labor. Furthermore, any drop in demand for industrial products immediately causes a curtailment of production that tends to equate supply with demand at current prices.

The Dilemma

Unfortunately, none of these forces, which work so well throughout most of the economy, have much effect in the agricultural markets. The demand for farm products, it is true, shows some elasticity, but not nearly enough to clear the market at what are considered "reasonable" prices. If farm prices should be cut in half, most of us would eat very little more. There would be a shift from grains to meat, which would help the situation because the production of meat from feed grains is relatively inefficient operation.

It is a sad fact that the domestic market simply cannot consume our agricultural output. The foreign market would have possibilities except for the political difficulties of disposing of surplus products abroad, even when we attempt to give them away. And no one hopes to sell abroad at the domestic price.

On the supply side, the agricultural situation is even more discouraging. Farm output tends to show a "perverse elasticity" in response to price; that is, a decline in price tends to result in an even greater output than before. As prices decline, the individual farmer tries to farm more intensively so as to maintain his income.

Comparing 1954 with 1947–9, farm prices were down seven per cent, costs were up 12 per cent, yet field crops remained roughly unchanged, and total farm output increased by eight per cent. And this was accomplished with 20 million acres out of production because of acreage allotments, and marketing quotas, while one-third of our rural counties were declared drought emergency areas!

This "perverse" behavior of farm output is not due to any lack of intelligence or initiative on the part of the farmer. He simply has no other choice of action.* He is selling in an area of almost perfect competition. There are so many farmers, and even the largest farmer produces such a small percentage of the total individual crop, that it is simply impossible for them to get together to restrict production, and so bolster prices. If even the 100,000 largest operators were to agree, their effect would be insufficient, since they control only about one-quarter of total production. There is competition in other fields, but nowhere does it produce such deleterious effects.

Agricultural Costs Differ

The most notable difference in the cost structures in agriculture and manufacturing is found in the relationship between fixed and variable costs. In manufacturing, a relatively high percentage of total costs are found to be variable costs, comprising mostly labor and materials.

Unless the selling price covers at least the out-of-pocket variable costs it does not pay to go into production. In farming, the same principle applies, but variable costs are so low that it would pay the farmer to plant and harvest even if his selling prices were to decline to a small fraction of what they are now. This is the reason why agricultural output does not respond proportionately to a decline in prices.

Labor On the Farm

Another peculiarity in agriculture is the lack of mobility of the capital and labor invested in it. When there exists an excess of capacity in some manufacturing industry, both the facilities and the labor tend to move to other industries where they can be more profitably employed. Of course, there has been a marked exodus from the farm to the city over the past 100 years, but the rate has not been fast enough. Nor are the physical facilities transferable to other uses. During the depression, when there was a general excess of manufacturing capacity, many factories were idle or unoccupied, but our farms went merrily along producing as much as before. Another collapse of farm prices would have the same result. No doubt, many farmers would find themselves foreclosed off their farms; but new occupants would be coming in to take over the land at lower prices, and the new price would be low enough to enable them to produce at a profit.

An interesting phenomenon now occurring is rising land prices in the face of falling farm income. There are a number of reasons for this, but one of them is the desire of the individual farmer to balance his heavy investment in equipment against the amount

of land on which he can apply it. Hence, he feels that he can afford to pay a good price for land, since it will require no more expensive machinery to cultivate it.

Is Agriculture Sound?

It is commonplace to say that agriculture is basically sound, but it might be worthwhile to ask how sound it actually is. In the sense that the industry that produces a basic necessity like food is indispensable, agriculture is definitely and basically sound. But in the sense that an industry is sound that cannot be operated profitably without government support in a free-enterprise economy naturally raises serious doubts.

If the government withdraws price support, agricultural prices will plummet; and yet the Iowa farmer and his son, who cultivate 200 to 300 acres, will go on producing as before, and so aggravate the situation. Extremely low prices will not induce the consumer to eat very much more. During the depression it was computed that it would be cheaper for the wheat farmer to burn his crop as fuel than to attempt to market it and to pay for coal with the proceeds.

Problems of Agriculture

The farm problem, as we know it today, is of rather recent historical origin. For centuries the basic problem of human existence was to obtain enough food to maintain life. Even today there are vast populations in the world that are underfed, but transferring surpluses to them poses difficulties beyond our current abilities to solve. In many of the advanced nations of the world agricultural surpluses are a constant and increasing embarrassment.

It may be argued, of course, that current surpluses are nothing to worry about if one takes the broad point of view. The largest current surplus in this country in terms of yearly consumption is in cotton, with a year's supply on hand. A year's supply of one or more basic commodities might not be deemed overwhelming, particularly in the case of cotton, where it would take 20 years of storage to equal the value of the cotton at current costs and prices. The importance of surpluses is probably less on account of their current size than it is on account of their tendency to inexorable increase.

Where Do We Go From Here?

What of the future? The steady increase in population will increase the demand for food and fiber. The increasing standard of living will further increase food consumption at the lower levels. The shift to meat will aid the feed grains. But on the other hand, we have remarkably increased productivity per acre. Over the past 35 years production has increased 60 per cent on approximately the same total acreage. And there is no area in the economy where more research is being done with the purpose of increasing quantity and quality of output. The day of crop shortages is, indeed, in the far distant future.

No Simple Solution Possible

It is not the function of this article to propose political solutions to the farm problem. What may be economically sound may not be politically feasible at the moment. Or a program that would eliminate the problem of price supports and surpluses might not be consonant with the American way of life. As in most matters of economic policy, there are always several alternatives from which to choose. Our choice of means to an end will be influenced by many considerations, both conscious and subconscious.

If we believe that agriculture is so basic to our economy that we cannot afford to risk destroying all incentive in that area, it would seem that some form of government intervention is imperative. There are too many farmers for them to get together in an attempt to equate supply with demand; the forces of competition in a free market would drive down prices to levels that would endanger the stability of the whole industry.

The government can continue to support prices in one form or another as it has been doing. The "land bank" program may be of some help in crop reduction; but, typically, farmers take out of cultivation their worst land, and farm the rest more intensively, thus producing very little less than before.

The government could establish production quotas in terms on units of output (bushels, bales, etc.) and destroy whatever is produced in excess of the quota. Each of the programs would require extensive and complicated machinery. Each would treat some farmers less equitably than others. And each involves some violation of what are generally considered the principles upon which our nation and our prosperity are founded.

But we cannot get along without a farm program of some sort. What is needed are statesmen of courage and knowledge and honesty who can choose a reasonable alternative, and get the necessary support for its implementation. ▲

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SFFCO Meets in Roanoke

Group Hears Etheredge Call for Strong Southern Organization

ATTENDANCE of 60 control officials and 55 industry representatives helped make the 14th annual convention of the Association of Southern Feed and Fertilizer Control Officials one of the most successful on record. Retiring president M. P. Etheredge presided at sessions held June 28–30 in the Hotel Roanoke, Roanoke, Va.

In his address, Etheredge pointed out that last year the association voted to include pesticides in its coverage but as yet the name of the group has not been changed to incorporate the addition. He expressed the hope that food and drug officials of the 14 Southern states will eventually agree to join the SFFCO to form one strong regional association.

No action was reported from the pesticide division and Etheredge commented that the group is looking forward to a report from that unit. He invited industry members to assist in developing the activities of the division.

Reviewing the services of control officials to agriculture, P. H. DeHart of the VPI agricultural extension service pointed to the problems caused by lack of uniformity in state laws and in recommendations from land grant colleges. Difficulties are compounded, he added, through radio and TV information received by farmers from States other than their own.

A big problem confronting control officials, DeHart continued, is providing for a "speedy adjustment in state laws to permit the use of new scientific discoveries without too much delay."

"The soil is the only manufacturing plant I know," said H. L. Dunton, head of the VPI agronomy department, "that improves with use if properly managed." Reviewing briefly soil studies under way at VPI and in other colleges, he stressed the wide variations of soils in characteristics and ability to produce.

Researchers have found, said Dunton, that due to certain colloids in a particular soil the soil doesn't lose plant nutrients by leaching as rapidly as another soil. In other tests, alfalfa is being produced on a soil with a pH of 5.6, an accomplishment that would have been considered impossible only a few years ago.

"We must recognize that certain soils have limited capabilities," he continued, "and therefore cannot produce good returns on large amounts of fertilizer. In other words, if we consider fertilizer as the raw material going into the manufacturing plant, the soil, then we readily see that certain soils cannot use as much fertilizer efficiently as certain other soils."

In making a sound fertilizer recommendation, Dunton noted, past treatment of the soil must also be considered. If this is known, along with the effect of that treatment on the soil, a more accurate recommendation can be made.

Soil tests are also important, as an aid in determining fertility level and fertilizer needs, but, stressed Dunton, in Virginia they are not used as the only factor in making recommendations. Properly interpreted, he said, it can be of value.

Illustrating the point that different crops have different requirements, Dunton described one farm on which tobacco, alfalfa, corn, pasture and millet were to be fertilized but where only one fertilizer analysis had been purchased—a tobacco grade and analysis. After studying all factors, it was found that six grades and analyses should have been used for most efficient fertilization.

R. W. Ludwick, deputy in charge, New Mexico Feed and Fertilizer Control Office, was elected president of the association. Dr. E. W. Constable, North Carolina's state chemist, and Bruce Poundstone, head, department of feed and fertilizer at the Kentucky agricultural experiment station, will serve as vice-president and secretary-treasurer respectively.

Bruce Cloaninger, South Carolina, was selected as chairman of the executive committee which will include, in addition to Cloaninger and the three officers, M. P. Etheredge, Mississippi; Harold H. Hoffman, Florida; L. C. Jacobs, Tennessee; and Maurive Row, Virginia.

Next year's meeting is tentatively scheduled to be held on June 17–19 in Birmingham, Ala. ▲

More Profit . . . Fewer Acres

SPEAKING before the SFFCO, Russell Coleman, executive vice-president, National Plant Food Institute, continued to stress greater efficiency as the principal means of maintaining net farm income and of disposing of surplus farm goods.

He used the accompanying tables to show what could happen if all corn and cotton in the US was grown according to the best recommended practices, including the proper use of plant foods. "A number of state experiment stations have shown recently," he pointed out, "that by using fertilizer to produce more per acre, the cost of producing each unit can be reduced. In this way, farmers can realize more net return from the farm products which they sell."

With corn, projected figures show the average yield could be increased from 37 to 70 bushels per acre and that the required supply could thus be grown on less than half the acres now devoted to this crop. Average cost of producing each bushel could be lowered from $1.00 to 80 cents per bushel.

Treating cotton in a similar manner, yields could be upped from 339 pounds of lint to 520 pounds, again producing domestic requirements on about half the acres currently used. In this example, average cost of production could be reduced from 28 to 20 cents per pound.

"Although this information may be academic," he concluded, "it does illustrate what I believe is a sound principle; namely, that proper plant food applications could be used to increase net farm income and at the same time could contribute toward solving our surplus problem." ▲

Corn

	Acreage	Total Production (Bushels)	Profit Per Acre[1]	Total Profits On All Acres[1] ($1,000,000)
Current Production Practices	80,000,000	3,000,000,000	$14.80[2]	$1184[2]
Recommended Production Practices	**35,700,000**	**2,500,000,000**	**$42.00[3]**	**$1499[3]**

[1]Corn valued @ $1.40 per bu.
[2]Calculated on average yield 37 bu.; average cost $1 per bu.
[3]Calculated on average yield 70 bu.; average cost $.80 per bu.

Cotton

	Acreage	Total Production (Pounds)	Profit Per Acre[1]	Total Profits On All Acres[1] ($1,000,000)
Current Production Practices	20,000,000	6,800,000,000	$10.17[2]	$203[2]
Recommended Production Practices	**10,400,000**	**5,400,000,000**	**$46.80[3]**	**$487[3]**

[1]Cotton valued @ $.314 per lb.
[2]Calculated on average yield of 339 lbs.; average cost $.28 per lb.
[3]Calculated on average yield of 520 lbs.; average cost $.22 per lb.

These figures are estimates prepared by the National Plant Food Institute with the cooperation of USDA.

Silicones for Seed Treatments

Lubricating Value Shown in Lab Tests

WORK conducted at the New York Agricultural Experiment Station indicates that silicones may prove valuable as lubricants for pea seed protectants. Discussing the materials in the PLANT DISEASE REPORTER, J. J. Natti and W. T. Schroeder comment that results demonstrate silicones warrant further consideration.

Coating the seed with a fungicide affects delivery through the drill by imparting to the surface of the seed the protectant's physical properties. In some cases, the materials may be lubricative and increase the rate, but some of the most effective protectants now in use have frictionable properties that retard the rate of flow.

A lubricant to overcome this problem would enhance value of the materials, especially on peas. Graphite is one product that has been used successfully, but grower acceptance has been poor, however, because of its dark color and tenacity to skin and clothing.

Three silicone emulsions from Linde Air Products Co. were used in the New York tests—LE-45, LE-46 and X-521 on Wilt Resistant Surprise pea seed. The emulsions were used alone, superimposed on a previous treatment with Orthocide and with slurry treatments of Delsan A-D and Ortho Seed Guard in which the silicones were used in place of water when the slurries were prepared.

It was found that when used alone, Delsan A-D, Ortho Seed Guard and Orthocide 75 decreased the rate of delivery of pea seed through a grain drill 13 to 15 per cent from that of untreated seed. Delivery was decreased four per cent by Arasan, but Spergon had no influence.

Most of the retarding influences were eliminated when each of the silicone emulsions were superimposed on the dust treatment, and they demonstrated the same effect on the two slurry treatments.

Although the emulsions, in Petro dish tests, reduced seed germination and retarded development of plumules and roots, they had no apparent effect on germination or subsequent development of the seedlings in greenhouse and field soil plantings. It is felt that the dispersing medium of the emulsion and not the silicones caused the adverse effects noted in the dish tests.

When compared to an untreated control, LE-45 or LE-46 resulted in a six per cent increase in delivery rates while X-521 showed a decrease of about two per cent. The latter is waxy and treated seeds tended to form aggregates.

The experimenters suggested future work covering effectiveness of the silicones under field conditions with machine planters. ▲

Influence of Silicone Coatings on Delivery of Peas from a Grain Drill in Lab Tests.

Treatments[a]		Seed delivery	
Pesticide	Silicone	Seed delivered per minute [b] (gm)	Difference from amount of untreated seed delivered[c] (per cent)
—	—	270	—
—	LE-45	285	+5.5
—	LE-46	286	+5.9
—	X-521	263	−2.2
Orthocide 75	—	230	−14.8
Orthocide 75	LE-45[d]	270	0.0
Orthocide 75	LE-46[d]	260	−3.7
Orthocide 75	X-521[d]	267	−1.1
Delsan A-D	—	232	−14.1
Delsan A-D	LE-45[e]	265	−1.9
Delsan A-D	LE-46[e]	258	−4.4
Delsan A-D	X-521[e]	272	+0.7
Ortho Seed Guard	—	235	−13.0
Ortho Seed Guard	LE-45[e]	257	−4.8
Ortho Seed Guard	LE-46[e]	248	−8.1
Ortho Seed Guard	X-521[e]	270	0.0
Arasan	—	260	−3.7
Spergon	—	269	−0.4
Least difference required for significance	(19:1)	5	
	(99:1)	7	

[a]LE-45, LE-46, and X-521 applied at rate of ½ pt./bu.; Orthocide 75, 1.3 oz.; Delsan A-D, 1.7 oz.; Ortho Seed Guard, 1.95 oz.; Arasan (50 per cent), 2.1 oz.; and Spergon, 2.0 oz. per bushel.

[b]Average weight of 8 determinations.

[c]+ indicates amount of seed delivered exceeded that from untreated seed; − indicates amount of seed delivered was less than that from untreated seed.

[d]Silicone treatment superimposed on treatment with Orthocide 75.

[e]Silicone emulsion used in place of water in preparation of slurry.

Chemicals

Lindane Off-Flavor Reported by USDA

Off-flavor effects on lindane treated crops, even after a number of years following application of the insecticide, are reported by USDA.

Potatoes grown in soil previously planted in cucumbers and treated with lindane, showed off-flavor, taste and odor when stored three months at 55° F. Off-flavors in other food crops have been noted on soils the season following lindane treatment. Soil applications were found to increase the effects more than foliar treatment.

Limed Corn Fields May Require Zinc

Speaking at the recent Alabama Fertilizer Conference, Dr. John I. Wear stated that corn fields limed as recommended may need additional zinc. The experiment station researcher said it is important to apply zinc for all pecans and for corn on zinc deficient sandy soils when the soil has been adequately limed.

"It is known," he continued, "that corn will not take up as much zinc from the soil that has been limed as from the same type of soil that has not been limed."

Gereral Chemical has New Arsenate Form

General Chemical Division has released a new form of calcium arsenate designed for spray application. Advantages claimed over arsenate dusts include less waste, longer residual effect and better insect control.

The material is being sold as General Chemical High Suspension Calcium Arsenate.

Fungicides Protect Plants From Smog

California researchers say that plants can be protected from smog damage by treatment with organic fungicides. It has also been found that plants receiving abundant water are more susceptible to damage than those grown under dryer conditions.

Although withholding water for short periods may limit smog damage, it is felt that primary success will be gained with the use of fungicides.

Miller Adds Moly To Soluble Mixes

Miller Chem. & Fert. Corp. is now producing fertilizers containing molybdenum. Products available include two soluble plant foods—Nutri-leaf 60 and VHPF and Liqua-Leaf liquid fertilizer.

Each of the formulations contains the equivalent of .088 per cent molybdenum oxide, and is sold for starter fertilizer and foliar spray applications.

USDA Claims Sage Control with 2,4-D

USDA has found 2,4-D an effective partner in the fight against western sage brush. After large scale tests over some 10 years, it has been found 100 per cent effective against most species.

Treatment costs were low enough to permit practical application as a supplementary control method.

The butyl ester form of 2,4-D acid was particularly outstanding in both effectiveness and economy, but because of high volatility should not be used where drift could damage nearby crops. In such cases butoxy ethanol or propylene glycol butyl low-vol esters are recommended.

Results were best when the butyl ester form was applied to foliage of rapidly growing sage brush after plants had put on three to four inches of new twig growth. In all cases, adequate control was achieved with two pounds of 2,4-D acid equivalent in an emulsion of nine gallons of water and a half gallon of diesel oil per acre.

Latest Tolerances

MGK Repellent 11, McLaughlin, Gormley King Co., has been approved for use on dairy cattle and in dairy barns. A butadiene derivative, it was developed by Phillips Petroleum from whom MGK obtained a marketing license.

Calcium carbonate. A tolerance of 25 ppm for residues on certain grains has been approved.

Lindane. NACA'S BHC committee has withdrawn a petition for establishment of residue tolerances.

Sodium o-phenylphenate. A tolerance of 5 ppm for residues on apples and pears has been approved.

3-(p-chlorophenyl)-1, 1-dimethylurea. DuPont proposes a tolerance of 1 ppm, for residues in or on certain citrus fruits.

Carbon disulfide, carbon tetrachloride, ethylene dibromide and *ethylene dichloride.* Petitions from seven companies propose tolerance exemptions when the materials are used as fumigrants on certain specified grains.

Phygon-XL Tested For Algae Control

United States Rubber Co. reports that Phygon-XL (dichlone), will economically kill algae and some water weeds without harming fish. The announcement came after four years of tests in which the University of Wisconsin first showed the chemical's value as an algicide.

New AS&R Pesticides

New compounds possessing the water repellancy of conventional silicones and fungicidal and pesticidal values of the arsenicals have been synthesized by American Smelting & Refining.

Known as arsonosiloxanes, they are believed to have special value for use in damp locations to protect materials from deterioration due to moisture and insect attack.

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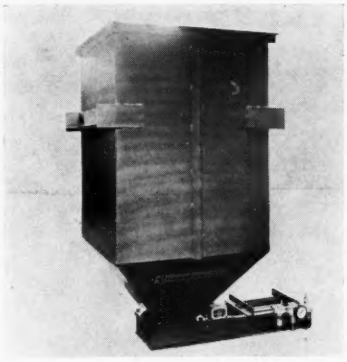
TAMPA, FLA.
COLUMBUS, OHIO

Equipment & Supplies

New Hopper Scale From Richardson

A new automatic suspension type hopper scale allowing for cumulative weighing from a series of feeders or a single hopper has been introduced by Richardson Scale.



Sizes run from 33 to 200 cu. ft. with capacities up to 6,000 lbs. The unit can be used with any standard feeding arrangement—gravity fed from bins, screw-fed, belt-fed or from a vibrating conveyor.

Optional components include an automatic printing attachment to record batching formula data and remote recording mechanisms. For more data

Circle 275 on Service Card

Ladcote Coatings Now on Multiwalls

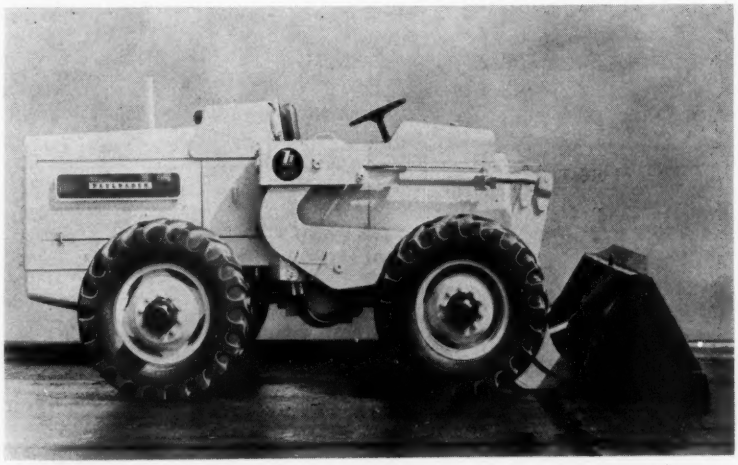
Multiwall bags are now available with new Ladcote modified polyethylene coatings formulated by the L. A. Dreyfus Co. The material has 25 per cent more resistance to the transmission of moisture vapor than conventional polyethylene of equal coating weight.

A variety of Ladcote compounds are available, permitting use of a coating with special properties varied to individual requirements. The coatings have demonstrated excellent resistance to acids, alkalies and moisture.

For a brochure with samples of coated paper and a list of bag manufacturers supplying multiwalls using these coatings

Circle 276 on Service Card

Award for Payloader Design



Jon W. Hauser, St. Charles, Ill., has been awarded the 6th annual Industrial Design Award for his design work on The Frank G. Hough Co. model HH Payloader. It was the first time that equipment of this type has been selected for the award, the highest US honor for industrial design.

Mines Bu. Develops Phos. Mining Device

The US Bureau of Mines is credited with development of a new phosphate mining machine that promises to reduce operating costs of Western underground phosphate rock operations. Called a planer, it was designed and built at the Bureau's Spokane, Wash. field office.

For information, request Report of Investigations 5219, "Design and Development of a Pneumatic Vibrating Blade Planer for Mining Phosphate Rock; A progress Report," from the Bureau, Publications Distribution Center, 4800 Forbes St., Pittsburgh 13, Pa.

Thermo-Panel Coil Heaters Marketed

Dean Products is marketing a new series of Thermo-Panel Coil heaters designed to speed heating of drums and tanks. An immersion type and a model that can be clamped on a drum for outside heatings are available.

The latter type appears of value in plants where pesticides are being added to fertilizer goods. Standard models are available for 55-gal. drums and units can be obtained for other drum and tank sizes. For more information

Circle 277 on Service Card

Power Steering for Towmotor Lift Trucks

Towmotor fork lift trucks of 6,000 lbs. capacity and over can now be equipped with improved power steering—during assembly or after delivery.

With the new design, three and a half turns of the steering gear turn wheels right or left in a full radius. A power steering pump of bigger capacity and a smaller power cylinder results in greatly increased steering speed. For a descriptive folder

Circle 278 on Service Card

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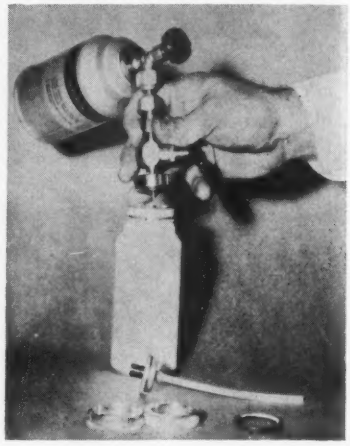
New Screw Top For Aerosol Cans

A snap-on screw top for aerosol cans is offered by Builder's Sheet Metal Works, Inc. The refillable



aerosols offer potential application in laboratory work and for the home garden or greenhouse trade.

For a descriptive leaflet

Circle 279 on Service Card

Remington Rand Portable Photocopier

A Portable Photocopier designed to reproduce pages of bound books as easily as flat material has been marketed by Remington Rand.

Weighing 13 pounds, it produces full size copies of any record and will photocopy by direct light transmission or by reflected light.

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Suppliers' Briefs

A factory expansion at The Broyhill Co., Dakota City, Neb. has doubled the firm's productive capacity. Broyhill has also completed the pilot model of a new high-clearance machine for application of chemicals and for detasseling.

International Paper Co. Reorganization of the Bagpak Div. sales department divides the country into four sales regions with regional headquarters in Baltimore, Chicago, New Orleans and Denver.

Joy Mfg. Co. has named Wm. Hanson, Jr., manager of conveyor products at its New Philadelphia plant.

Raymond Bag Co. Eastern district sales manager for the Multiwall Bag Div. is Deane F. Wicks with headquarters at 21 West St., New York City.

Simplicity Engineering Co. Ronald Jenkins has been named assistant advertising manager.

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PEST REPORTS

Presented in cooperation with the Economic Insect Survey Section, Plant Pest Control Branch, Agricultural Research Service, USDA.

Major 'Hopper Populations

Grasshoppers were the dominant insect problems in Iowa and Missouri around the first of July. In the former state, the state entomologist's office, Iowa Department of Agriculture, initiated an emergency control program against the pests. This involved spraying of rights-of-way on all primary highways and county roads in the southern sections where populations warranted treatment. The state made insecticides available for this program. Treatment of cultivated lands by farmers was progressing satisfactorily in early July. The grasshopper problem in this state has been aggravated by drought. Population counts ranged from 1–35 per square yard in the southern third of the state.

Populations of 12 to 65 per square yard in Missouri caused heavy damage to pastures, red clover and alfalfa in the northern two-thirds and the southwest area of the state. Considerable damage also occurred in margins of row crops. The two-striped and the migratory grasshopper had reached the adult stage and were laying eggs by July 4 in this state. The outlook in Missouri was for severe infestations if hot, dry weather occurred during July and August.

Grasshoppers were also of concern in several additional states. California reported infestations on large acreages in Shasta, Tehama, Nevada and other counties. A large migration which threatened cotton and seed alfalfa in Kern county was stopped by spraying a protective strip of about 12,000 acres. Control measures were also applied in other infested areas in the state. Damaging infestations were reported on crop and rangelands in some eastern Colorado counties, and economic injury was occurring in several Utah areas.

The pests were damaging crops, especially corn, alfalfa and sorghums, over Oklahoma with loss more pronounced in western area. Light damage to rangeland was also recorded in northern and west central counties. Infestations were classified as severe in many eastern and southwestern areas of Nebraska with counts of 9–36 per square yard in alfalfa and 12–81 in margins of legumes and row crops. Minnesota reported extremely high levels throughout most of its agricultural areas but the young grasshoppers were still concentrated around hatching beds. Counts in Wisconsin were heavy in some fields and populations were becoming abundant, 12 nymphs per square yard, in legumes in northeast South Dakota. Severe populations continued on rangeland of Comanche, Clark, Barber and Kiowa counties of Kansas in areas where control measures were not applied.

Other states reporting damaging or threatening populations include Nevada, Wyoming, Alabama, South Carolina, Delaware and Texas.

Figures released by Grasshopper Control Project, USDA, July 6, showed that cooperative control measures had been undertaken up to that time on a total of 894,101 acres of rangeland in six states. Spraying had been done on 210,421 acres in Douglas county, Colo., and in the southeast area of that state; 92,340 acres in Comanche county, Kans.; 226,897 in the Cuba-Levington and Rosebud-Amistad areas of N. M.; 177,162 in Major, Ellis, Woodward, Texas and Woods counties, Okla.; 56,239 acres in Gray, Oldham, Deaf Smith and Briscoe counties, Tex.; and 131,042 acres in Johnson, Douglas, Platte and Hot Springs counties, Wyo.

European Corn Borer Heavy in Several States

During late June and early July several states reported damaging infestations of the European corn borer. Some of these states, particularly Massachusetts, New York, Maryland and Kentucky, had unusually heavy attacks. In Massachusetts borer eggs were more abundant, averaging about one mass per plant in Plymouth county, than for the past eight years. The pest was considered to be about five times heavier than last year in the Hudson Valley of New York, and Maryland had heavy populations in central and eastern areas. Kentucky had the heaviest general infestation since 1950. Corn planted before May 10 in the latter state was heavily infested. Likewise, early corn in northern Alabama was severely attacked.

Among the major corn-producing states, Illinois and Iowa seem to anticipate the most trouble from the borer this year. Egg-laying for first generation was heavy in areas of Illinois ranging as high as 2–4 masses per plant on early corn in the northeastern section during the last

week of June. Although hot weather reduced number of unemerged moths, the outlook for the borer appeared generally serious in this state. Spraying was recommended to begin June 18 in southern area and July 1 in northern counties. The infestation was general in Iowa, heaviest in eastern half, but only in a few cases attained high potential indicated by the winter carryover. Severe drought conditions were expected to reduce borer activity in some parts of the state although a high second brood is anticipated and much loss where effective control measures are not carried out.

On the other hand, the corn borer picture was brighter in Nebraska and South Dakota. Populations were extremely low in comparison with last year in southeast and east central Nebraska and infestation was much reduced in southeastern South Dakota, especially in drought areas.

Spotted Alfalfa Aphid Reported Illinois, Mississippi and Georgia

The spotted alfalfa aphid has been reported from Illinois for the first time. A few specimens of this insect were taken at Murphysboro and Wolf Lake, Jackson county in early July. No economic damage had occurred. The aphid was also found for the first time in Mississippi in mid-June. Specimens were collected on alfalfa in Coahoma and Washington counties. The initial find in Georgia was made in Henry county in early July. Other than the record for Alachua county, Florida, these are the only reports of this destructive pest east of the Mississippi River.

During late spring and early summer, activities of the aphid in infested area of the West and Southwest were relatively light; however, some damaging infestations occurred in New Mexico and Texas, and build-ups were reported in early July in southern and central Kansas and in some areas of Utah and Colorado.

Boll Weevil Continues Heavy and Bollworms Increasing in Some Areas

Boll weevil square infestation counts were high in several areas in early July. These included counts of 28 per cent in 15 Georgia counties, 31 per cent in northeastern Alabama, 23 per cent at Waco, Texas, 15–59 per cent in 6 Louisiana parishes, 27 per cent in untreated cotton in South Carolina, and 35 per cent in west Tennessee. Infestation continued spotty in North Carolina and was increasing in some areas of Texas and Arkansas. Due mostly to hot dry weather, infestations were lower in the delta area of Mississippi than had been anticipated. First-generation field weevils were emerging by late June as far north as North Carolina.

Bollworms were considered a greater problem than boll weevil in some areas of South Carolina. Most of the heavy infestations were in the Coastal Plains region with as high as 25 per cent square infestation in some fields in Allendale county. Injurious infestations were reported in irrigated cotton in McLennan and Falls counties, Texas and in some fields in Pima county, Arizona. Increased activity was recorded in Arkansas, Arizona and some areas of Texas. Several states, including North Carolina, Mississippi, Louisiana and Oklahoma, however, reported only light activity.

Some Other Important Insect Activity

Destructive populations of chinch bugs migrated into corn and sorghums over wide areas of eastern Kansas and in many sections of Missouri. Nebraska reported severe infestations in southern counties with as many as 155–240 bugs per stalk of corn. Pea aphids reduced alfalfa yield as much as 50 per cent on the first cutting in some Colorado counties. Damage from corn rootworms appeared in Illinois early in July.

Unusually heavy build-up of plant bugs in alfalfa was reported from Sacramento Valley, Calif. These pests were abundant also in Idaho, Missouri and other areas.

Early in July, apple aphids were increasing in Yakima Valley of Washington and in areas of Michigan. Infestations were generally severe in Connecticut. An unusual amount of oriental fruit moth injury to peach twigs occurred in Massachusetts. New York and Michigan reported similar damage.

Orchard mites showed increases in some areas, particularly in Indiana and Ohio, and were reported as damaging in New Jersey and abundant in Missouri.

The Mediterranean fruit fly had been found in 22 Florida counties by July 11. As of that date the known infested counties were: Dade, Broward, Palm Beach, Hendry, Collier, Sarasota, Highlands, Lee, Polk, Hardee, DeSoto, Charlotte, Manatee, Brevard, Indian River, Martin, Pinellas, Hillsborough, Monroe, Okeechobee, Lake and St. Lucie.

Counties under Federal regulation effective July 13 were Broward, Collier, Dade, Hendry, Lee, Palm Beach and Pinellas. USDA is working closely with the Florida State Plant Board in the enforcement of parallel regulations covering spot infestation in the other infested counties. Known infested areas continue to be sprayed with malathion bait spray.

Tomato fruitworm caused heaviest damage to tomatoes in recent years in the Cullman, Ala., area, and were of concern in some sections of Missouri, South Carolina and Colorado. Potato leafhopper was heavy on potato, beans and alfalfa in several states, including Delaware, Maryland, Minnesota and Wisconsin. ▲

by Dr. Melvin Nord

PATENT REVIEWS

TVA Phos. Rock-Nitric Acid Patent

US 2,738,265 issued March 13, 1956, to F. T. Nielsson and assigned to TVA describes a process for reacting phosphate rock with nitric acid to produce a fertilizer.

As shown in Fig. 1, the process involves the steps of extracting phosphate rock with nitric acid and treating the extract slurry with ammonia to precipitate substantially all the P_2O_5 as dicalcium phosphate. The slurry is then treated by simultaneous addition of ammonia and carbon dioxide to convert the calcium nitrate remaining after treatment with ammonia alone to ammonium nitrate and calcium carbonate.

Addition of a small amount of sulfate early in the ammoniation step eliminates the necessity of careful distribution of ammonia introduced into the slurry and permits rapid ammoniation, thus greatly increasing the quantity of product that can be produced from equipment of a certain size in a specified time.

In addition to increasing the rate of production and eliminating difficulties due to localized over-ammoniation it also greatly increases the power of the slurry to absorb carbon dioxide so that complete carbonation can be attained in a later step with use of about one-seventh to one-fourth the quantity of carbon dioxide usually necessary. The reason for these effects is not known.

Monsanto Assigned Dust Free Herbicides

US 2,739,052 and 2,739,053 issued March 20, 1956 to H. L. Morrill and assigned to Monsanto Chemical Co. provides dust free dry formulations of an herbicide with a halo aryloxy substituted aliphatic acid as active ingredient.

A compound of this type, eg. 2,4-D, is fused with a solid absorbent material such as fuller's earth having a particle size of 15-50 microns. This product has improved lasting properties and resists more rainfall than ordinary 2,4-D formulations.

Seeds Protected by Halide Disinfectants

US 2,740,744 issued April 3, 1956 to W. W. Abramitis et al and assigned to Armour & Co. disclosed a method of protecting seeds from fungi by the use of tetra alkylammonium halides, such as tetramethylammonium bromide or chloride.

Reduction in Citrate Solubility Avoided

US 2,739,054 issued March 20, 1956 to L. E. Andres and Jean L. Iragne assigned to Potasse & Engrais Chimiques provides a method of manufacturing phosphatic fertilizers in a way that avoids any reduction in solubility in ammonium citrate.

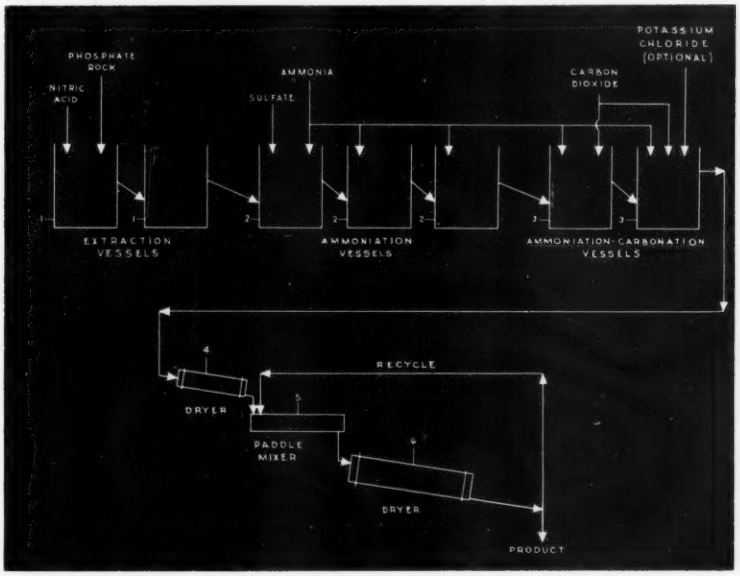
It involves the addition during the course of manufacture of up to two per cent of a magnesium compound such as magnesium sulfate.

Pelleted Phosphates From New Process

US 2,740,115 and 2,740,116 issued March 27, 1956 to L. H. Facer and assigned to Glen E. Cooley et al describes processes for manufacturing pelleted superphosphate and triple superphosphate fertilizers.

In the first patent, triple super is produced from phosphate rock by reaction with phosphoric acid of about 85 per cent concentration. The acid is sufficiently concentrated so that no artificial drying is required. Material is maintained in plastic form in the first stage by using excess acid and this excess is later reacted with an added quantity of ground rock.

The second patent describes a method of producing enriched superphosphate without using concentrated phosphoric acid. ▲



Statistics

Iowa Reports Drop In Soil Treatment

Iowa Extension Service reports that the use of soil insecticides declined during 1956 with 214,660 acres less than in 1955. The smaller acreage treated in 1956 is attributed to farmer pessimism over dry weather and poor crop prospects. Seed treatment, however, showed a remarkable increase of 293,660 bushels treated over 1955.

Pesticide Sales Up In West Germany

The Munich Economic Research Institute states West Germany has combined substantial production gains on insecticides and fungicides with considerable price reductions.

Output increased 16 per cent in 1955 to 66,300 tons, although value was only 9 per cent higher than in 1954.

In the first quarter of this year production advanced 14 per cent resulting in 22,000 tons produced, but yielding only 2.5 per cent more than last year.

Prices on insecticides and fungicides have dropped 10 per cent since 1952, the institute reports, with possible annual savings to farmers of $2.4 million.

World Fert. Use Double Since '38

World consumption of fertilizer has doubled since 1938. Highest world consumers of fertilizer per acre were New Zealand, The Netherlands, Hawaii, Belgium and Japan, according to a recent FAO report. United States consumption quadrupled since 1938, but U.S. farmers still average less per acre than most Western Nations.

On a world-wide basis the use of fertilizer has increased from 8,400,000 metric tons in 1938 to 17,000,000 metric tons in 1955.

Phos. Sales & Stocks Down from March

April production of superphosphate and other phosphatic fertilizers amounted to 244,644 short tons, a decrease of 1 per cent from March. Shipments totaled 208,638 tons, a decrease of 3 per cent from March. Stocks at the end of April were 18 per cent less than those held on March 31.

Preliminary totals covering July 1955 through March 1956 show these percentage changes from the previous comparable period:

Grade	Production	Shipments
Normal	...	+ 3
Enriched	−35	−25
Concentrated	+16	+ 9
Wet-base goods	−26	−34

April Sulfur Trade

April exports of sulfur (5,294 tons) are reported by the Bureau of Mines as the largest since November, 1951. There were no exports during the month.

Production — April, 1956

Compiled from Government Sources

Chemical	Unit	April 1956	April 1955	March 1956
Ammonia, synth. anhydrous	s. tons	[1]306,172	286,567	*316,734
Ammonia liquor, coal & coke (NH_3 content)		2,978,185	3,117,544	3,869,113
(Including diamm. phosphate & ammon. thiocyanate)	pounds			
Ammonium nitrate, fert. grade (100% NH_4NO_3)	s. tons	167,147	148,259	*196,357
Ammonium sulfate				
synthetic (technical)	s. tons	92,725	90,042	98,910
coke oven by-product	pounds	167,968,582	164,133,847	167,737,192
BHC (Hexachlorocyclohexane)	pounds	8,168,008	4,474,399	7,946,551
Gamma content	pounds	1,328,613	889,625	1,223,456
Copper Sulfate (Gross)	s. tons	6,944	6,496	
DDT	pounds	10,966,684	9,216,134	11,083,360
2,4-D Acid	pounds	2,530,908	3,142,302	2,521,997
esters and salts	pounds	2,597,757	3,075,128	2,038,719
esters and salts (acid equiv.)	pounds	2,033,169	2,262,056	1,622,942
Lead Arsenic (acid & basic)	s. tons	646	1,157	810
Phosphoric acid (50% H_3PO_4)	s. tons	312,054	311,551	*331,581
Sulfur, Native (Frasch)	l. tons	504,289	437,738	485,963
Recovered	l. tons	38,200	33,700	38,100
Sulfuric acid, gross (100% H_2SO_4)	s. tons	1,362,851	1,339,115	1,441,266
Superphosphate (100% APA)	s. tons	244,644	233,597	*246,634
Normal (100% APA)	s. tons	156,686	158,475	*150,818
Enriched (100% APA)	s. tons	978	5,241	1,623
Concentrated (100% APA)	s. tons	67,717	68,561	74,414
Wet Base (100% APA)	s. tons	1,515	1,319	424
Other phos. fertilizers	s. tons	17,748	N. A.	19,355
2,4,5-T Acid	pounds	401,895	190,870	375,150
Urea	pounds	69,308,640		71,934,920
Calcium Arsenate	s. tons	479	[2]	962

N. A. Not available. * Revised. [1] Includes quantities for plants previously not reporting. [2] Withheld to avoid disclosing figures for individual establishments.

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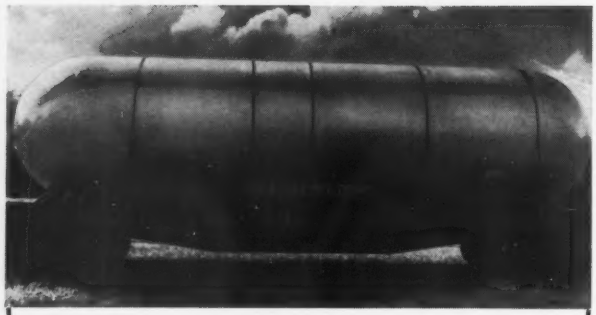

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General Office & Works: AURORA, INDIANA

One of Skyspray's C-2 aircraft used to spray malathion water bait over the 180,000 acre Florida Medfly area.

Medfly Hit by U-H & Skyspray

THIS summer United-Heckathorn is handling two large-scale air spray projects—one for control of the Mediterranean fruit fly currently threatening the Florida citrus industry and a second designed to combat spruce budworm on a one million acre section of Montana.

The $500,000 contract covering Florida operations provides for formulation of insecticide and application of the material to 180,000 acres. The entire area will be sprayed three times by Skyspray, an air spray firm owned by United-Heckathorn.

Chief chemist of the firm, M. D. Riddle, and E. S. Heckathorn, president, are in the area to supervise formulation of the malathion water bait specified by USDA.

Operations began in June with Skyspray utilizing a B-17, a B-18 and two C-82 planes, each capable of spraying some 300 acres a minute.

In Montana, E. G. Trimpey, operations manager, supervised a plant crew located in Bozeman. The $750,000 job is believed to have been the largest in the history of aerial spraying.

Work began in mid-June with planes including a DC-2, a DC-3 and a Tri-Motor Ford. DDT in diesel oil was prepared and trucked to landing fields located near five strategic towns. The operation was scheduled for completion by the end of July.

Lesser projects for United-Heckathorn and Skyspray include spraying 195,000 acres in Colorado for grasshopper control and operations in New Mexico for spruce budworm and grasshoppers. ▲

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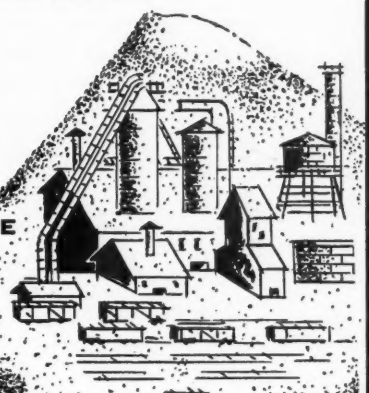

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editorial

WHAT Every Fertilizer Salesman Should Know." A subject like this might well require textbook treatment, but at the recent Delmarva Peninsula Fertilizer Association meeting, VPI's Dr. H. L. Dunton packed some excellent suggestions into his short talk.

First of all, said the head of Virginia's agronomy department, we must think of the soil as agriculture's manufacturing plant. "It is the only manufacturing plant," added Dunton, "I know of that will improve with good management." When cropping and fertilization techniques are adapted to the particular soil involved, it doesn't depreciate—it increases in value. Basic information for any salesman in the plant foods field is a thorough knowledge of the soils in his area.

Recognize, stressed Dunton, that different soils have different capacities to produce. There is nothing to be gained in selling a program for producing 100 bushels of corn on a soil capable of supporting only 40 bushels.

Past management is of major importance. Before attempting to sell your fertilizer you should know the crops grown during previous seasons, the plant foods that have been applied, liming applications and similar basic information.

For most salesmen, soil testing is an easy thing to sell and it can be used to good advantage—when it is properly interpreted and adapted to previous cropping and fertilizing activities. But, emphasized Dunton, it must be evaluated.

Crop requirements should be known—a farmer needs the correct raw material to produce a finished product at the lowest possible cost. Dunton cited one Virginia farm where the owner had stocked (or been sold) a single tobacco grade even though he was growing several crops on land complicated by more than one soil type. After a thorough investigation of the farm, Dunton and his associates concluded that at least six grades should have been purchased for the farmer to gain top efficiency.

Different varieties of a crop also affect plant food use and may require different fertilizers. A good salesman should be familiar with the varieties grown in his trade area.

Your salesmen, he concluded, must know and believe in the products they market and should demonstrate an enthusiastic approach to the part fertilizers can play in a successful farming enterprise. It's up to them to see that the farmer is provided with the correct raw materials for maximum production at the lowest possible cost.

DISCUSSIONS at the recent 21st meeting of the Farm Chemurgic Conference in Chicago centered around a relatively new coined word—"agribusiness." The term was defined by Dr. J. H. Davis, director of Harvard's Program in Agriculture and Business, as the sum total of all operations involved in the manufacture and distribution of farm supplies.

Main theme of the gathering was the need for business to be aware of the problems of the agricultural industry. "Because business manufactures and sells to farmers more than half of all farm production items," said Davis, "business is a decisive factor in determining the volume of farm production year by year." However, he emphasized, too many farm supply manufacturers do not have "a corresponding degree of responsibility for any problems or situations that may arise."

Farm problems will be agribusiness problems, in the "dynamic era" ahead, he continued, and they must be solved through the agribusiness approach. "By this approach, we should be able to improve the economic status of agriculture, reduce the roll of government on the farm front, enhance the profit opportunities of business and assure the consumer of high quality food at reasonable prices and with less drudgery of preparation."

FARM JOURNAL'S Wheeler McMillen warned the conference of potential dangers if farm markets and uses don't come closer to farm production. "When business feels hurt in the countryside stores and banks," he noted, "the pain is bound to reach into city streets through factory gates and into the payrolls of labor. . . . Industry and commerce and labor can all be losers if farmers lose."

"When as much research and as much intelligent energy have been exerted in marketing and utilization," McMillen added, "as have been expended to increase production, the backward salients will catch up."

The speakers raised a good point in emphasizing the responsibility of the business world to the agricultural plant. Certainly there are already signs that business elements are becoming aware of this and we need look no further than the fertilizer industry to find positive steps taken in efforts to assist agricultural workers.

The National Plant Food Council, through a farm bankers' program, educational materials, more profits from fewer acres theme and other programs, is making a strong effort. Companies in the plant food industry are making important individual efforts along similar lines. Many firms no longer use just salesmen; their staffs include technically trained men with farm backgrounds who not only promote goods but also offer service and factual information to their customers.

More assistance, although not for the immediate future, should result from passage of the bill which establishes a new USDA agency charged with developing industrial uses for agricultural commodities. Looking ahead it is possible to see entirely new markets for agriculture—providing raw materials to industry, supplementing the basic production of food and fibre. ▲

Buyers' Guide

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Ashcraft-Wilkinson Co., Atlanta, Ga.
Shell Chemical Co., Agr. Chem. Div., N.Y.C.

AMMONIA—Anhydrous and Liquor
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Commercial Solvents Corporation, New York City
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Phillips Chemical Co., Bartlesville, Okla.
Sinclair Chemicals, Hammond, Ind.
Sohio Chemical Co., Lima, O.

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AMMONIUM SULFATE
See Sulfate of Ammonia

AMMONIUM SULFATE NITRATE
Atkins, Kroll & Co., San Francisco, Calif.

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Chase Bag Co., Chicago, Ill.

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Sinclair Chemicals, Hammond, Ind.
Sohio Chemical Co., Lima, O.

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McIver & Sons, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

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Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

PHOSPHORIC ACID

American Agricultural Chemical Co., N. Y. C.

PLANT CONSTRUCTION—Fertilizer and Acid

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Bradley & Baker, N. Y. C.
Duval Sulphur & Potash Co., Houston, Tex.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
National Potash Co., N. Y. C.
Potash Co. of America, Washington, D. C.
United States Potash Co., N. Y. C.

POTASH—Sulfate

American Potash & Chemical Corp., Los Angeles, California
International Min. & Chem. Corp., Chicago, Ill.
Potash Co. of America, Washington, D. C.

PRINTING PRESSES—Bag

Schmutz Mfg. Co., Louisville, Ky.

PYROPHYLLITE

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pioneer Pyrophyllite Producers, Beverly Hills, Calif.

REPAIR PARTS AND CASTINGS

Stedman Foundry and Machine Co., Aurora, Ind.

SCALES—Including Automatic Baggers

Exact Weight Scale Co., Columbus, O.
Stedman Foundry and Machine Co., Aurora, Ind.

SCREENS

Ludlow-Saylor Wire Cloth Co., St. Louis, Mo.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

SHOVEL LOADERS

Clark Equipt. Co., Benton Harbor, Mich.
Hough, The Frank G. Co., Libertyville, Ill.
Tractomotive Corp., Deerfield, Ill.

SOILTEST EQUIPMENT

The Edwards Laboratory, Norwalk, O.

SPRAYERS

Finco, Inc., N. Aurora, Ill.

SPRAYS

Monarch Mfg. Works, Inc., Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.
Baughman Mfg. Co., Jerseyville, Ill.

SPREADERS, TRUCK

Baughman Manufacturing Co., Jerseyville, Ill.
Highway Equipment Co., Cedar Rapids, Ia.

STORAGE TANKS

Cole, R. D., Manufacturing Co., Newnan, Ga.

SULFATE OF AMMONIA

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Lion Oil Co., El Dorado, Ark.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFATE OF POTASH—MAGNESIA

International Min. & Chem. Corp., Chicago, Ill.

SULFUR

Ashcraft-Wilkinson Co., Atlanta, Ga.
Texas Gulf Sulphur Co., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFUR—Dusting & Spraying

Ashcraft-Wilkinson Co., Atlanta, Ga.
U. S. Phosphoric Products Div., Tennessee Corp., Tampa, Fla.

SULFURIC ACID

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Lion Oil Company, El Dorado, Ark.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

SUPERPHOSPHATE

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Davison Chemical Co., div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SUPERPHOSPHATE—Concentrated

Armour Fertilizer Works, Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TALC

Ashcraft-Wilkinson Co., Atlanta, Ga.

TANKAGE

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TANKS—NH3 and Liquid N

Cole, R. D., Manufacturing Co., Newnan, Ga.

TOXAPHENE

Ashcraft-Wilkinson Co., Atlanta, Ga.

TRUCKS—SPREADER

Baughman Mfg. Co., Jerseyville, Ill.
Highway Equipment Co., Cedar Rapids, Ia.

UREA & UREA PRODUCTS

Atkins, Kroll & Co., San Francisco, Calif.
Bradley & Baker, N. Y. C.
Grand River Chem. Div., Deere & Co., Tulsa, Okla.
Nitrogen Div. Allied Chemical & Dye Corp., N.Y.C.
Sohio Chemical Co., Lima, O.

UREA-FORM

Nitro-Form Agricultural Chemicals, Woonsocket, R. I.

VALVES

Monarch Mfg. Works, Inc., Philadelphia, Pa.

ZINC SULFATE

Tennessee Corp., Atlanta, Ga.

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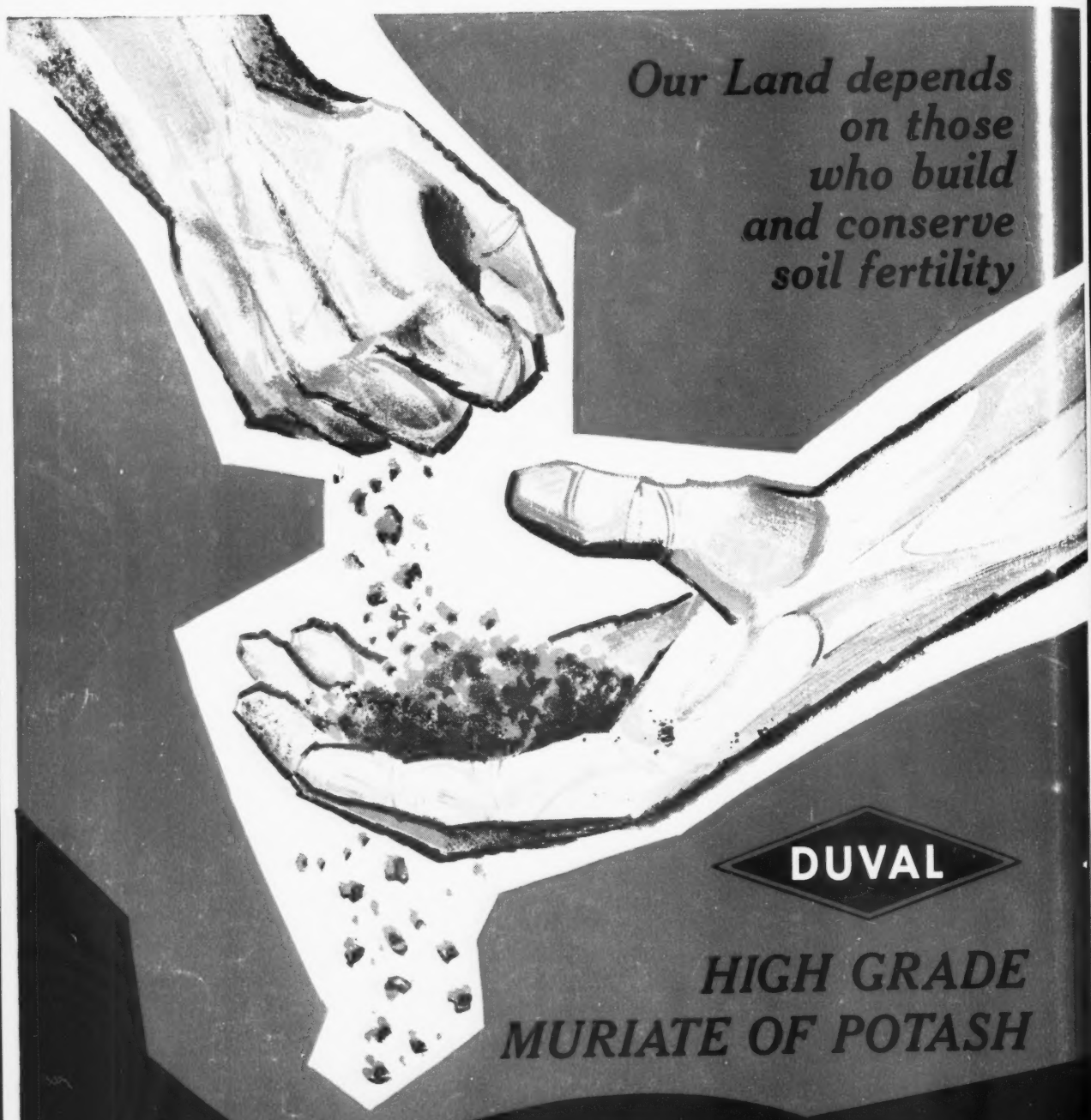

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